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RECENT DEVELOPMENTS IN THE DIVERSIFICATION OF DEVELOPING COUNTRIES' COMMODITY EXPORTS

Report by the UNCTAD secretariat

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Summary and conclusions

(i) This report provides statistical evidence for the 1980s on the experience of developing countries in reducing their dependence on a narrow range of commodities for their export earnings. Five main issues are addressed:

(ii) First, product coverage is widened compared with the traditional emphasis on primary commodities in diversification analyses, in order to improve the comparability of diversification experiences across commodities and countries, and to take account of the standardization of production processes that has occurred over the last two decades or so. The database created for this report includes therefore primary commodities plus related products, such as gold, precious stones and processed forms of a number of agricultural raw materials, minerals and metals. The database also distinguishes three processing stages in order to allow for a better assessment of vertical diversification.

(iii) Secondly, a number of different measures of export dependence are discussed. Starting with the assumption that the main aim of export diversification is to reduce an economy's vulnerability to adverse internal and external shocks, this analysis is based on data regarding a country's dependence on its three main commodities rather than on its entire commodity sector. It is also argued that it is not very promising to apply portfolio theory to export diversification or to calculate concentration ratios.

(iv) Thirdly, this report sheds light on the diversification experience of regional country groups and individual countries. It concludes that few developing countries have diversified their export structure successfully, and that most that did do so are in South and South-East Asia and developing America. The situation for the developing countries of sub-Saharan Africa and Oceania remains bleak.

(v) Fourthly, regarding the kind of products into which successfully diversifying countries moved, the report concludes that where horizontal diversification occurred, countries moved mostly into other raw materials, in particular food items, which can be grown under similar climatic and technological conditions as the traditional ones and which can be marketed in a way that the exporters are familiar with, i.e. their marketing of traditional crops. Countries that were successful in vertical diversification diversified mostly into products of "footloose" industries, such as textiles, clothing and footwear.

(vi) Fifthly, the report addresses the question as to whether export diversification was constrained more by market-access barriers or by supply-side constraints. The main conclusion drawn from the incidence of tariffs, tariff escalation and non-tariff measures by regional country groups is that if barriers were lowered for developing countries to access markets of developed countries, their market opportunities and potential for diversification would improve. However, rather than focus on market-access barriers as such, policies to reduce export dependence should instead focus on issues dealt with by the successful countries, such as supply capacity, competitiveness and ability to take advantage of market opportunities and to overcome market-access barriers.

Introduction

1. This report is the first of a series of studies that analyse the experience of developing countries in export diversification during the 1980s with a view to learning about the formulation and implementation of diversification-related policies. The purpose of this study is to examine trends in vertical and horizontal diversification in developing countries' merchandise exports during the 1980s, as well as to explain the methodological approach adopted to create the database on commodity dependence used in this series. The second study of the series will emphasize the development of a conceptual approach that applies the findings of recent economic growth and trade theories to the diversification issue. The third study will analyse the interrelationship between diversification and the main economic indicators of developing countries by looking at quantitative variables, e.g. macroeconomic policies and the orientation of a country's external trade regime, to assess whether there is a significant difference between countries that have diversified and other developing countries regarding the provision of economic incentives. It will also look at variables associated with the ability to react to incentives and will address the question as to whether selective government interventions have been conducive to export diversification.

2. High dependence on a narrow range of primary commodities for export earnings is a problem in many developing countries. The volatility of prices of primary commodities has led to unstable export earnings. Large fluctuations of export earnings, in turn, have adverse effects on income, investment, employment and inflation and hence on economic development. In light of this, the United Nations Conference on Trade and Development agreed, at its eighth session, that one of the goals of the international community is a gradual reduction in the excessive dependence on the export of primary commodities through horizontal as well as vertical diversification of production and exports, and that international support should assist such efforts. It was also reaffirmed that UNCTAD should continue to assist in diversification programmes as well as in processing, marketing and distribution programmes.[1] More specifically, the Conference recognized that "enhancing the contribution of the commodity sector to development requires countries to have a domestic policy and an institutional environment that encourage diversification and enhance competitiveness, ..." [para. 194] and that "comprehensive commodity-sector strategies should be put in place within a macroeconomic policy framework that takes into consideration a country's economic structure, resource endowments, and market opportunities" [para. 195].

3. Regarding the discouraging situation in many developing countries in sub-Saharan Africa (SSA), the United Nations New Agenda for the Development of Africa in the 1990s (UN-NADAF) recognized that diversification is essential for sustained economic growth. As emphasized in the Agenda, such diversification efforts need a policy approach, with the government providing a framework of strategies and supporting policies. The actual implementation of the diversification programme should rest mainly with the private sector. It appears that distorted macroeconomic and trade policies, as well as adverse consequences of government interference, and an unfavourable evolution in the terms of trade have contributed to slow economic growth and declining export market shares for

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[1] Cartagena Commitment (TD/364), paras. 190, 203 and 211.

many developing countries, in particular for the primary sector in sub-Saharan Africa. Some of these policy distortions may also have been the result of policies formulated on unrealistic expectations following the exceptionally high commodity prices in the late 1970s, for example those for tropical beverages and petroleum, which are important sectors in many African economies.

4. The notable economic success of a group of dynamic East Asian economies over the last two decades or so has raised interest --and debate-- on the merits and limits of national policy reform and state intervention as a basis for stimulating export diversification. It is now widely acknowledged that economic policy in these East Asian countries has been influenced by a free-market doctrine tempered by state intervention. However, there is disagreement about the impact this intervention has had on these countries' economic performance. A crucial issue in this debate is whether desired structural transformation can be hastened through selective government intervention designed to promote particular economic sectors or companies, or whether government activities should be broad based and limited to pursuing sound macroeconomic policies, establishing an open economy, providing the basic social, legal and economic infrastructure, creating a suitable climate for private enterprise, and ensuring a high level and appropriate composition of human capital formation. Another issue is whether developing countries in other areas should (or could) adopt an economic policy strategy similar to that of the East Asian countries.

5. Regarding external factors, lowering market-access barriers will improve market opportunities for commodity exports and hence the international environment for both the expansion of total exports (i.e. traditional and non-traditional items) and for export diversification (i.e. increasing non-traditional exports). However, some developing countries that have higher barriers than others have nevertheless expanded and diversified their exports. This suggests that, rather than focusing on market-access barriers as such, policies for reducing export dependence may have to address issues dealt with by the successful countries, such as supply capacity, competitiveness and ability to take advantage of market opportunities and to overcome market access barriers. The impact of tariff escalation, non-tariff barriers and vertically integrated industry structures on diversification are discussed briefly.[2] The influence on export diversification of basic factors, including geophysical, geographic, climatic and topographic characteristics of a developing country, as well as its natural resources in the agricultural, fishery, forestry and mineral sectors, has already been addressed in detail in a recent UNCTAD report,[3] and will not be discussed here.

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[2] For a discussion of national and international measures designed to increase market opportunities for both traditional and non-traditional commodity exports from developing countries, and for examples of successful circumventions of market-access barriers of developing countries, see UNCTAD, 1994b. For a detailed discussion of market-access issues related to diversification in general, see UNCTAD, 1989a.

[3] The main finding of the report (UNCTAD, 1993, p.26) with respect to these factors was that while certain basic factors such as unfavourable natural resource endowment, geophysical and climatic characteristics and size of the domestic market of a country set certain limits to the development of diversification activities, these were not decisive barriers, but rather obstacles to be overcome or circumvented.

Chapter I

STATISTICAL ISSUES REGARDING THE ASSESSMENT OF COMMODITY EXPORT DIVERSIFICATION

6. A rigorous assessment of the diversification of developing countries' commodity exports requires an appropriate database. Empirical evidence suggests that prices of primary commodities have typically been much more volatile than those of manufactures (World Bank, 1994, p. 52) and that primary commodity prices have been declining since the mid-1970s (ibid., p. 14). The instability and decline of these prices translate into instability and decline of export earnings for those countries that depend on primary commodities for their exports earnings. Large fluctuations in export earnings have adverse effects on income, investment, employment and inflation and hence economic development. For this reason, empirical work on diversification of commodity exports has often started with measuring developing countries' dependence on total (non-oil) primary commodity exports (see UNCTAD, 1989b; World Bank, 1994, chap. 2). However, a number of problems in interpreting diversification statistics arise from this measure of dependence on *primary* commodities and of dependence on the commodity sector *as a whole*. The database developed for this series of studies has tried to take account of the following problematic aspects.[4]

7. First, the traditional definition of "primary commodities" is too narrow because it omits some commodities that are important for several developing countries. In particular, this definition does not usually include precious stones or gold, two primary commodities that account for a substantial part of foreign-exchange earnings for a large number of developing countries. Nor does it include semi-processed and processed forms of hides and skins (leather and leather articles), rubber (rubber articles such as examination gloves or tires), wood (veneer sheets, plywood and other wood articles, as well as paper and paperboard), silk (yarn and fabrics), cotton (yarn, fabrics, articles and clothing), jute (jute products), and iron ore (steel). The exclusion of semi-processed and processed forms of these commodities impairs the comparability of data as the definition of primary commodities includes the processed forms of some other primary commodities, for example, of fruits and vegetables (juices, fruit and vegetable preparations), cocoa (chocolate), tobacco (cigarettes, etc.), fuels (refined petroleum and liquified gas), and non-ferrous metals (semi-manufactures of copper, nickel, aluminium, lead, zinc and tin).

8. Secondly, the traditional measure of dependence does not allow for a disaggregated assessment of horizontal and vertical diversification as it does not distinguish any processing stages. While horizontal and vertical diversification may be equally important for a country's economic development, requirements regarding technological, managerial and marketing skills differ greatly between, for example, horizontal diversification into raw materials such as cereals or horticultural products and vertical diversification into processed forms of cotton or metals. A diversification policy designed to raise horizontal

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[4] In annex I, alternative measurements of diversification, including concentration indices and export portfolios are disccused in further detail. See annex II for a full account of the methodology used for developing the database for this study.

diversification may have to differ from one designed to foster vertical diversification as vertical diversification may involve a higher level of technology, skills and initial capital investment. Vertical diversification may also be associated with higher learning effects and therefore generate more dynamic externalities than horizontal diversification.

9. Thirdly, looking at dependence on the commodity sector as a whole allows only for an assessment of horizontal diversification from commodities into manufactures rather than of diversification *within* as well as out of the commodity sector. Several developing countries have experienced a strong performance of and diversification within their commodity sector parallel to their diversification into manufactures. An analysis based on an aggregate measure would miss the fact that export diversification is often the result of a strong, sometimes traditional, commodity sector. In addition, as the reduction of a country's vulnerability to sector-specific adverse changes on world commodity markets can be considered the basic objective of export diversification, its decreased dependence on a limited number of commodities is a more meaningful measure of its overall success in diversification than its decreased dependence on the commodity sector as a whole. Dependence on the commodity sector as a whole, as well as the experiences of individual developing countries in vertical and horizontal diversification, is discussed in chapter 2, sections A-C. Section D highlights the evolution in developing countries' dependence on their three main commodity sectors.

10. The fourth aspect is that relative price movements between different commodities and between commodities and manufactures can influence the measurement of diversification. Given that statistics on commodity dependence are usually based on export values, the impact of these price developments on statistics measuring changes in the level of commodity dependence is that they overestimate the extent of diversification when prices drop, and underestimate its extent when prices rise relative to measures based on volumes.

11. Regarding the evolution of non-oil primary commodity prices[5] over the last few years, figure 1 shows that: (i) real prices for non-oil primary commodities declined by about 50 per cent between 1980 and the beginning of the 1990s; (ii) the price fall in agricultural commodities accounted for the bulk of the drop in the aggregate price index; and (iii) beverages was the commodity group with the sharpest drop in prices. Regarding individual commodities, prices in terms of current United States dollars rose for a range of commodities, including bananas, tobacco, tropical timber, copper, manganese ore, nickel and zinc between 1980 and the beginning of the 1990s, while only the price of tropical timber rose in real terms during this period.[6] Given the general price decline in real terms, the use of these statistics for the 1980s tends to overestimate the extent of diversification. In addition, the unparalleled drop in prices for beverages suggests that there has actually been a lesser extent of diversification within the commodity sector from beverages into other commodity groups than that

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[5] Note that data for figures 1-6 refer to *primary* commodities in the traditional sense, i.e. excluding the additions outlined in annex II, as no aggregate data for the enlarged groupings are available.

[6] For statistics on these price developments, see UNCTAD Commodity Yearbook (various issues), table A.1, concerning nominal prices, and World Bank (1994, p. 13) concerning real prices.

measured on the basis of export values. The decline in primary commodity prices, in particular for beverages, has had its largest impact on countries that relied heavily on the export of primary commodities, particularly beverages, for their foreign-exchange earnings. While export diversification is not necessarily an economic objective in and by itself,[7] these price developments emphasize that an important way for a country to reduce its vulnerability to both volatility and sustained declines in commodity prices is to diversify its export structure.

12. The impact of a change in the price of commodity exports on the value of a country's earnings from those exports also depends on the evolution of the volume of commodity exports. However, commodity-specific data on the volume of exports are not to date available for all commodities. As a consequence, it is not possible to distinguish "passive" diversification, arising from adverse relative price movements or from a decline in a country's market share for its main commodities, from "active" diversification, arising from a genuine rise in the volume of non-traditional exports. Figures 2 to 6 give an idea of the development of the volume of non-oil primary commodity exports, displaying volume indices calculated by using the same four indices (for non-oil primary commodities as a group, for food, for agricultural raw materials and for minerals and metals) for all groups of countries. Figure 2 suggests that the volume of non-oil primary commodity exports from developed countries, as well as from developing countries in Asia, has risen to the extent that these countries achieved a substantial increase in the real value of their non-oil primary commodity export earnings despite the drop in prices. Countries from developing America have, by and large, maintained the real value of their non-oil primary commodity exports despite the sharp drop in the mid-1980s. In contrast to the above regions, the commodity price decline of the last 20 years has led to a substantial decrease in the real value of non-oil primary commodity exports from the group of African countries; the volume of non-oil primary commodity exports from these countries has declined, as well as their values, as illustrated in figure 3.[8] Moreover, figures 4 to 6 suggest that the export volume of agricultural raw materials (fig. 5) and of minerals and metals (fig. 6)[9] from African countries has dropped, while the volume of food exports (fig. 4) from these countries has registered a slight increase over the last 20 years; however, the increased volume of food exports was not translated into a substantial increase in the real value of food exports because food was the commodity group had experienced the sharpest decline in prices over the same period (see fig. 1).

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[7] This issue will be addressed in detail in the second study of this series.

[8] This may suggest that there has been a vicious circle of decreasing yields, declining export volumes and earnings, and lower resources financing essential imports for maintenance, investment and ongoing production. The interrelationships between dependence and export earnings, debt-service obligations, foreign direct investment, etc., will be analysed in the third study of this series.

[9] It appears that the enormous percentage increase in the export volumes of minerals and metals that West Asian countries have achieved over the last 10 years has not had a major impact on the markets, as their market shares are very small. On the other hand, this development illustrates the success some of these countries have had in using their large energy resources as inputs for the energy-intensive processing of imported metal ores, such as the production of aluminium.

13. In light of the particularly sharp drop in world market prices for tropical beverages during the 1980s, table 1, a and b, sheds some light on the question as to whether countries for which coffee or cocoa accounted for a substantial part of their foreign-exchange earnings in either 1979-1981 or 1989-1991 succeeded, at least partly, in compensating for the decline in world prices for these exports by higher export volumes. The table shows that the volume of coffee exports was lower for only 7 out of the 28 selected countries, while for cocoa the same holds for 7 out of the 17 countries. This means that most coffee- exporting countries that reduced their dependence on coffee substantially[10], including Côte d'Ivoire, El Salvador, Ethiopia, Haiti, Madagascar and Sierra Leone, experienced a drop in the volume of coffee exports. Such drop in export volumes may have been the outcome of a deliberate diversification strategy, or due to problems arising in connection with an inappropriately functioning internal marketing and distribution system,[11] as well as bad weather. By contrast, Colombia, Kenya and Uganda substantially reduced their dependence on coffee despite an increase in the volume of coffee exports, suggesting that they succeeded in promoting other commodity exports with a higher unit value than that of coffee.[12] It is also interesting to note that Guatemala and Mexico are the only two of the selected countries for which values of coffee exports increased more than volumes; this indicates that these countries succeeded in improving the unit value of their coffee exports, perhaps by raising the quality of their crops.

14. Regarding cocoa exporters, it appears that a number of countries actively promoted the export of cocoa. Indonesia, Singapore, the Solomon Islands, Malaysia, Ecuador and Côte d'Ivoire substantially raised both the value and the volume of their cocoa exports between 1979-1981 and 1989-1991. Apart from Côte d'Ivoire, the rise in cocoa exports from these countries occurred from a low absolute level; thus, relatively small changes in the absolute level of cocoa exports from these countries cause substantial changes when measured in percentage terms. It seems that the dramatic increase in exports of cocoa beans from Malaysia and Indonesia - the latter country's world-market share grew from under 0.5 per cent to over 5 per cent during the 1980s - was due largely to three factors. First, many farmers in these countries responded to high cocoa prices in the world markets in the early 1980s, engaging in crop substitution in favour of cocoa, since cocoa production allows for a relatively quick return on investment compared to that of alternative crops such as palm oil and natural

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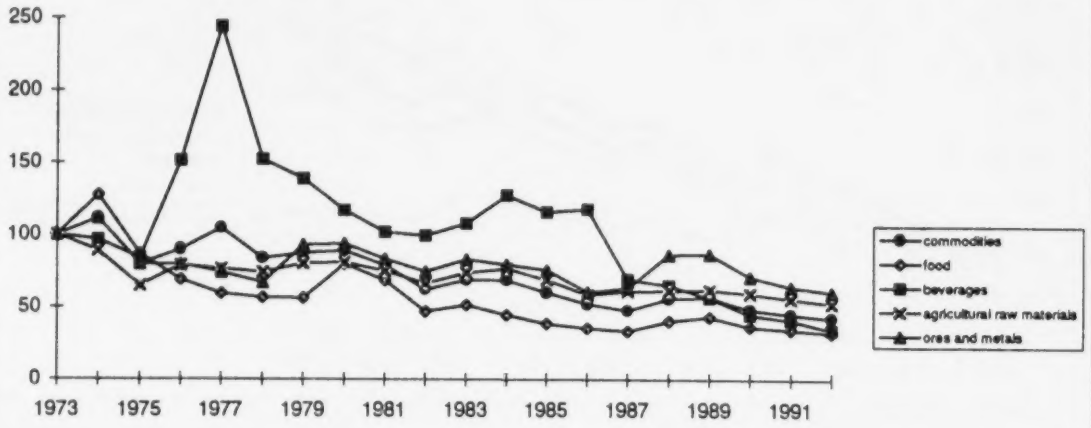
[10] See chapter 2, table 6, for data on the development of individual countries' dependence on coffee and cocoa exports.

[11] This seems to have been the case, for example, in Madagascar where the volume of production stagnated while that of exports declined during the 1980s (ITC UNCTAD/GATT: "Atelier sur l'exportations du café: consultations en gestion du commerce du café au niveau de l'entreprise: Madagascar", internal document). In Ethiopia, a combination of factors seems to have been responsible for the drop in export volumes. The internal marketing system did not allow coffee growers to sell their products to whom they wanted at remunerative prices, at a time when prices for other agricultural products like grain substantially increased. In addition, socioeconomic and political changes hampered the proper functioning of the internal distribution system from coffee collection through to processing and marketing (ITC UNCTAD/GATT: "Coffee export workshop: enterprise level export management consultations: Ethiopia", internal document).

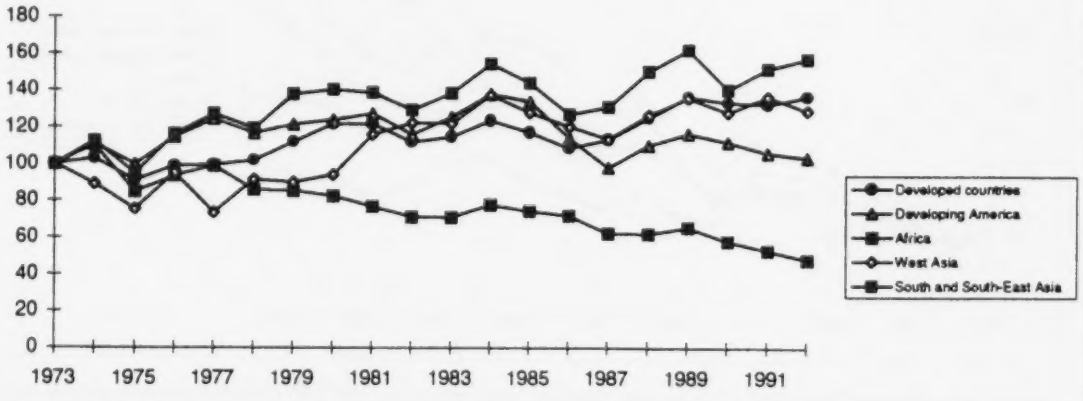
[12] For data on Colombia, see UNCTAD, 1994a.

Figure 1: Real market-price indices of selected non-oil primary commodity groups, 1973=100 (deflated by export unit values of manufactured goods from developed countries)



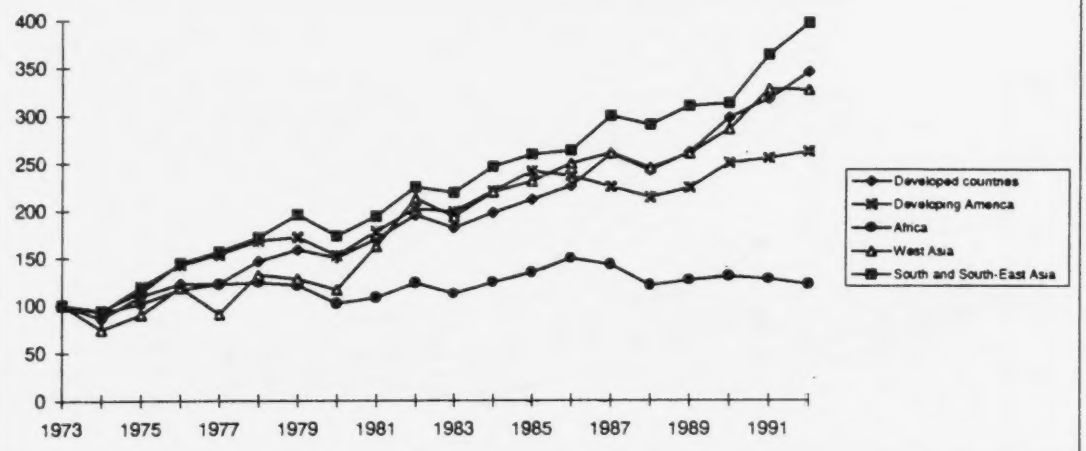
Source: UNCTAD database.

Figure 2: Real value of non-oil primary commodity exports by geographical region, index numbers: 1973=100 (deflated by export unit values of manufactured goods from developed countries)



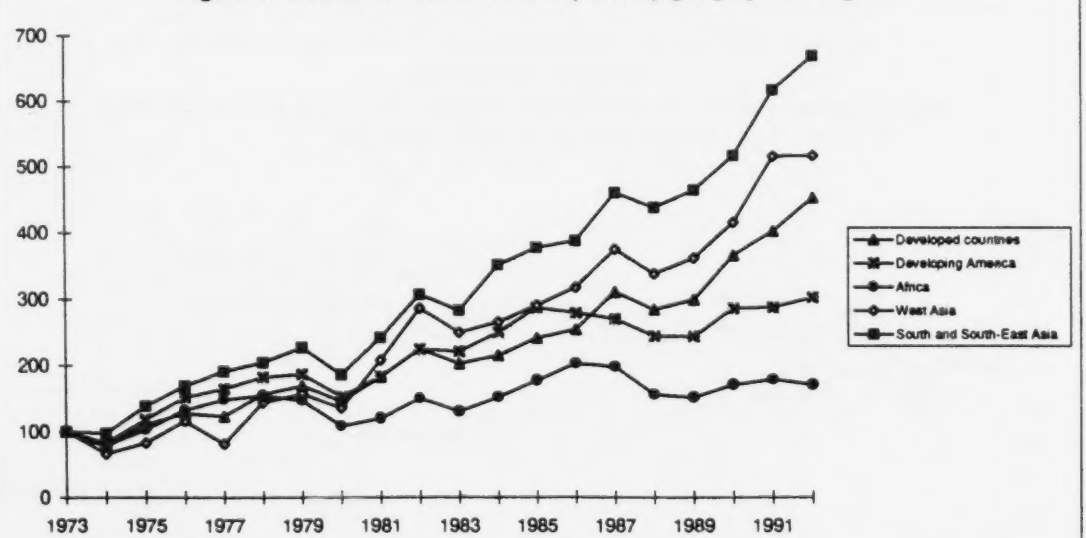
Source: Nominal values from *UNCTAD Commodity Yearbook (various issues)*, price indices from *UNCTAD Monthly Commodity Price Bulletin* (various issues).

Figure 3: Volume of non-oil primary commodity exports by geographical region, index numbers: 1973=100



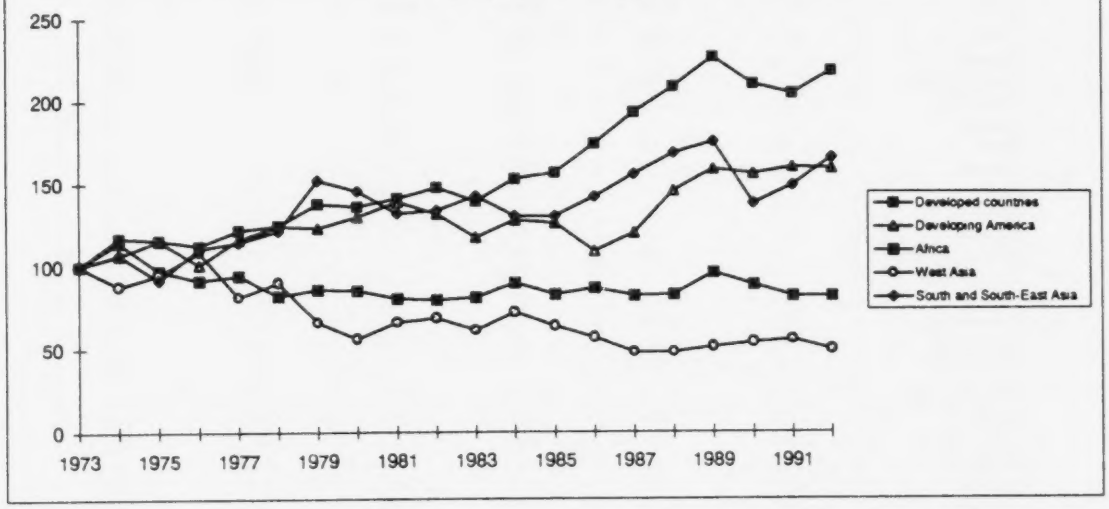
Source: Nominal values from *UNCTAD Commodity Yearbook;* price indices from *UNCTAD Monthly Commodity Price Bulletin.*

Figure 4: Volume indices for food exports by geographical region



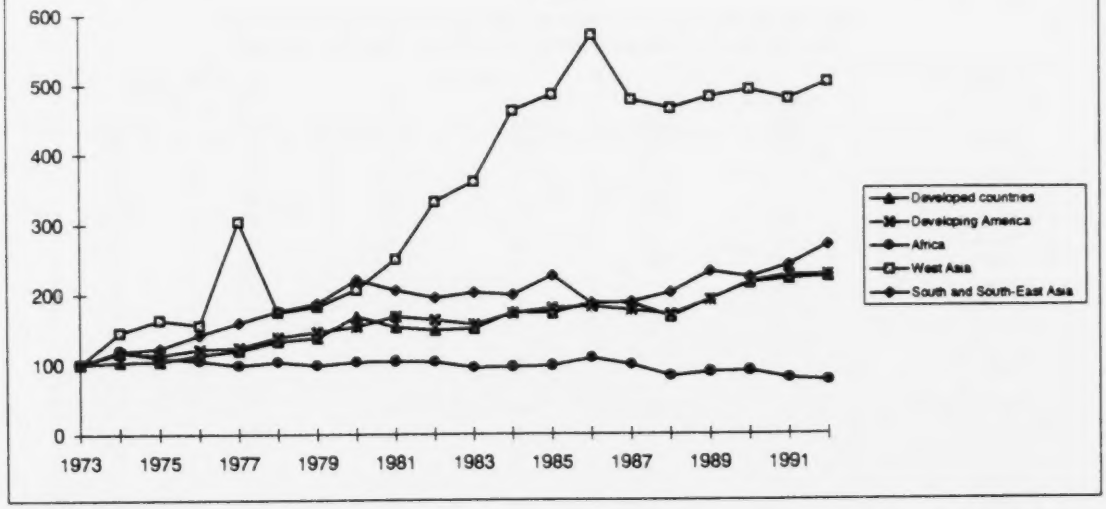
Source: Nominal values from *UNCTAD Commodity Yearbook;* price indices from *UNCTAD Monthly Commodity Price Bulletin.*

Figure 5: Volume indices for exports of agricultural raw materials by geographical region



Source : Nominal values from *UNCTAD Commodity Yearbook*; price indices from *UNCTAD Monthly Commodity Price Bulletin.*

Figure 6: Volume indices for exports of minerals and metals by geographical region



Source : Nominal values from *UNCTAD Commodity Yearbook*; price indices from *UNCTAD Monthly Commodity Price Bulletin.*

Table 1a: The development in values and volumes of coffee exports from selected developing countries, 1979-1981 and 1989-1991 averages

Regions and countries	1979 - 1981		1989 - 1991		Percentage change 1989-91 / 1979-81	
	US$ mln value	000 mt volume	US$ mln value	000 mt volume	value	volume
World	**11040**	**3740**	**8225**	**4886**	**75**	**132**
Africa	2646	959	1429	995	54	104
Guinea	8	3	7	7	85	271
Cent. Afr. Rep.	24	10	19	16	82	159
Cameroon	260	94	185	141	71	150
Burundi	73	24	64	35	87	143
Zaire	140	68	102	95	73	139
Rwanda	65	30	70	40	107	131
Togo	24	9	16	12	69	130
Kenya	279	82	184	97	66	117
Uganda	335	127	174	148	52	116
Un.Rep. of Tanzania	150	52	90	54	60	105
Eq. Guinea	1	0	0	0	50	100
Ethiopia	262	83	185	73	71	87
Cote d'Ivoire	628	233	218	187	35	80
Madagascar	169	63	47	50	28	79
Sierra Leone	27	11	8	7	29	65
Latin America	6541	2171	4716	2755	72	127
Mexico	458	142	1366	234	298	165
Costa Rica	268	88	262	138	98	157
Guatemala	398	127	983	191	247	150
Ecuador	167	64	126	95	75	148
Honduras	192	65	181	95	95	146
Brazil	1973	724	1367	964	69	133
Colombia	1930	618	1425	727	74	118
El Salvador	573	155	228	117	40	76
Haiti	54	17	23	11	42	65
Nicaragua	160	51	56	29	35	56
Asia	904	361	744	622	82	172
Indonesia	539	223	413	387	77	173
India	204	73	161	99	79	135
Papua N. Guinea	154	49	122	65	79	132

Table 1b: The development in values and volumes of exports of cocoa beans from selected developing countries, 1979-1981 and 1989-1991 averages

Regions and countries	1979 - 1981		1989 - 1991		Percentage change 1989-91 / 1979-81	
	US$ mln value	000 mt volume	US$ mln value	000 mt volume	value	volume
World	**2750**	**1109**	**2304**	**1868**	**84**	**168**
Africa	1918	777	1547	1193	81	153
Cote d'Ivoire	692	298	899	695	130	233
Ghana	575	194	341	249	59	128
Cameroon	181	76	124	88	68	116
Sierra Leone	22	9	10	8	43	94
Equ. Guinea	18	7	5	6	29	83
Nigeria	319	148	135	119	42	81
Togo	34	14	12	7	35	51
Sao Tome & Pr.	19	7	4	3	18	43
Benin	13	5	0	0	0	0
Latin America	502	203	260	232	52	114
Ecuador	38	18	61	55	159	301
Dominican Rep.	56	25	39	42	69	167
Brazil	340	135	121	107	36	79
Asia	177	76	349	342	197	447
Indonesia	10	5	96	100	921	1870
Singapore	17	7	84	81	496	1100
Solomon Islands	1	0	4	4	516	854
Malaysia	74	32	169	160	229	495
Papua N. Guinea	69	28	41	40	60	140

Note: Among regional groups, countries have been ordered according to the change in export volumes between 1979-1981 and 1989-1991.

Source: UNCTAD Commodity Yearbook, various issues.

rubber. In addition, farmers started to grow cocoa as a hoped-for insurance against adverse implications of low prices for natural rubber. Secondly, diversification into cocoa was sustained by the use of high-yielding hybrids which became available as a result of government-sponsored research and development; this led to a boost in productivity[13] which allowed for profitable cocoa growing even during the period of low prices on the world cocoa market in the late 1980s. Thirdly, the production of cocoa beans received further impetus in Malaysia and Indonesia from the development of highly productive domestic cocoa-processing facilities.[14] It would appear that research and development activities, stable climatic conditions and the favourable geographical location were the main factors for Malaysia's success. Research and development activities have led to quality improvements and the adoption of new basic processing techniques which have made it possible to produce beans whose flavour is comparable to that of the high-quality cocoa grown in Ghana. Because of Malaysia's stable climate, the country is a reliable source of beans in a market that is subject to large oscillations induced by the cocoa trees' susceptibility to rainfall. Marketing arrangements with big firms have allowed it to tap traditional markets, for example, in Europe and the United States of America, for exports of cocoa butter, while its geographical location made it possible for domestic firms to export chocolate to countries in East and West Asia where there is a growing demand for chocolate-coated convenience food and whose population is less quality-conscious and, in particular, less brand-conscious than that in traditional markets. In the Solomon Islands, the cocoa industry seems to have evolved through the decisions taken by small-scale producers because the medium-term price prospects for copra, the major competing crop, were poor and because of the financial problems of the Commodities Export Marketing Authority, which had to reduce buying prices for copra several times in the early 1990s. Contrary to Indonesia and Malaysia, government involvement in research and development, as well as in the provision of marketing and extension services, seems to have been minimal. With regard to Benin, the reported large drop in cocoa exports seems to be due largely to previously inflated data owing to re-exports of cocoa smuggled from Nigeria.

15. Cocoa exports from Côte d'Ivoire seem to have had an adding-up problem, or fallacy of composition, given that this country's market share was over 35 per cent in 1989-1991. An *individual* exporting country has an adding-up problem[15] when an expansion in the export volume of a specific commodity leads

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[13] The average yield of cocoa production in Malaysia was about 600 kg per ha in 1991, with the most efficient producers obtaining 1.5-1.0 tons per ha, compared to an average output of about 500 kg per ha by major African producers (UNCTAD, 1995c).

[14] In Malaysia, the share of locally processed cocoa beans in total cocoa production increased from virtually nil at the beginning of the 1980s to about 30-40 per cent at the end of the 1980s. In 1993 for the first time, export earnings from processed cocoa products exceeded those from cocoa beans me (UNCTAD, 1995c).

[15] An adding-up problem for a *group* of countries occurs when individual countries can produce small additional amounts of a commodity without affecting world prices, while their combined additional supplies drive down world prices. Investment decisions designed to expand production that would be profitable for price-taking producers *individually* may then result in lower world prices, lower export revenues and lower production profitability.

to a decrease in the net revenues from its export, as a result of the country's sizable market share and also the low price elasticity of world demand for the commodity. Exporters of tropical beverages as a group can influence world market prices for these commodities in the short run because of the long gestation period of these perennial crops. Akiyama and Larson (1994) found that four countries in sub-Saharan Africa *individually* have an adding-up problem, namely Côte d'Ivoire (cocoa) and, to a lesser extent, Ghana (cocoa), Kenya (tea), and Malawi (tobacco).[16] It appears that growers of other food crops are able to adjust production much faster than the producers of the above crops to changes in world market prices for their commodity. Nevertheless, the large increase in cocoa production in East Asia shows that there has been a substantial supply response to *rising* cocoa prices over the last 20 years or so, while the supply response to *falling* world market prices for cocoa seems to have been much lower.[17]

16. The possibility of having an adding-up problem for commodity exports requires that the diversification programmes of developing countries be harmonized within and across regions. Concern has been expressed that structural adjustment programmes supported by the World Bank and the International Monetary Fund may have contributed to the development of an adding-up problem and downward pressure on world prices for specific commodities through the country-by-country approach and the lack of a global commodity perspective. It is argued that the policy changes implied by such adjustment programmes lower the costs of producing and marketing export commodities and give producers and traders a greater incentive to produce and export. Lower international commodity prices than would have otherwise occurred are therefore allegedly the possible impact of structural adjustment programmes.

17. In an effort to evaluate the effects of structural adjustment made in Ghana and Nigeria during the 1980s on world cocoa prices, Coleman et al.(1993, p. 39) conclude that the "simulation results show that world cocoa prices would have been on average 8% higher and the value of world cocoa production 6% higher on average had there not been any structural adjustment programs in Ghana and Nigeria over the period 1982/83-1989/90." However, they contend that the impact of these programmes on the decline of world cocoa prices was relatively small, since 1989/90 world prices in real terms would have been about 45 per cent lower than prices which prevailed in the early 1980s, compared with an actual decline of 55 per cent, and that the "major part of the world cocoa price decline in the 1980s can be attributed to the rapid production increases in other countries - Côte d'Ivoire, Indonesia, and Malaysia" [ibid.], rather than to the consequences of structural adjustment programmes. They also give empirical support to the well-known argument that free trade is not optimal for countries whose exports have a sizable influence on world market prices, such as Côte d'Ivoire for cocoa. "From the simulation runs on Côte d'Ivoire we have the result that had the export tax on cocoa been higher and closer to what is estimated to have been the optimal level in the 1980s, Ivorian total welfare would have been about the same but with lower cocoa production. In spite of the lower total production, Ivorian export

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[16] Regarding countries outside Africa, it is usually thought that Brazil has an adding-up problem for coffee.

[17] The latter suggests that there are barriers to exit from cocoa production in a number of countries. This issue will be discussed below.

revenue from cocoa would have been about the same due to higher world prices. It is to be noted too that probably total agricultural production and export revenue would have been higher because labor and land not engaged in cocoa production would have been used to produce other agricultural commodities for domestic consumption or export" [ibid., p. 41].

18. This result does not imply that producing countries should *raise* their export taxes or have *more* restrictive trade policies for their commodity exports.[18] Rather, it illustrates that in order to give sound advice to countries that have the power to influence the world price of a particular commodity, people formulating commodity- and country-specific policy recommendations should take into account the following: (i) the spillover effects of policies, which are adopted in one producing country on the welfare in the other countries that produce the same commodity, and (ii) the potential policy responses by those other countries. This, however, has generally not been the case (Schiff 1994, p. 10).

Chapter II

VERTICAL AND HORIZONTAL DIVERSIFICATION OF COMMODITY EXPORTS

A. General diversification experience and protectionism

19. Most developing countries continue to be very dependent on commodities for their export earnings. Regarding all developing countries as a group, the data in table 2 suggest that between 1979-1981 and 1989-1991, only a few countries reduced their overall commodity dependence, while a much larger number of countries reduced their dependence on raw commodities and increased the share of their commodity exports in processed forms.[19] The data also suggest that overall commodity dependence was, on average, declining in South and South-East Asia, West Asia and Latin America, while it was unchanged in Africa, the Caribbean and developing Oceania. Regarding dependence on commodity exports distinguished by processing stages, the data suggest that countries in North Africa and in South and South-East Asia were especially successful in reducing

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[18] Whether free trade or a restriction on exports is the optimal policy for the exports of commodities with an adding-up problem depends on the choice of reference group: free trade will maximize world welfare, while an optimal, non-zero export tax will maximize welfare in the countries producing the respective commodity with an adding-up problem (Schiff, 1994, pp. 8-9).

[19] As discussed in detail in annex 2, the wider product coverage on which the statistical analysis in this report is based tends to show less success of diversification out of commodities and more success in processing compared to the results obtained when looking at primary commodities according to the traditional definition only. However, comparing the data in table 2 with those of annex table A3 shows that widening the product coverage accentuates specific developments, while it does not result in qualitatively different statistical data.

the share of their unprocessed commodity exports. Countries in West Asia, Latin America and the Caribbean also have made some progress in this area. But the situation changed little in sub-Saharan Africa (SAA): 27 out of the 40 countries are still highly dependent on unprocessed commodity exports. By contrast, there was a move from raw to semi-processed and/or processed commodity exports in North African countries as they substantially reduced their dependence on raw commodity exports during the 1980s. It is also noteworthy that dependence on processed commodity exports increased more in developing countries in South and South-East Asia and in developing America than in others. Combined with the fact that these countries have, in general, been the most successful in reducing their overall commodity dependence, this suggests that their diversification out of the commodity sector went hand in hand with a strong performance of their commodity sector as a whole.

Table 2: Developing countries distributed by determined shares of commodities in total merchandise export earnings, (1989-1991 average; 1979-1981 average in brackets)
(Number of countries)

Region	Total commodities *			Raw commodities *			Semi-processed commodities *			Processed commodities *		
Share (%)	>70	70-50	<50	>70	70-50	<50	>40	40-20	<20	>40	40-20	<20
North Africa	6 (6)	0 (0)	0 (0)	1 (4)	1 (2)	4 (0)	0 (0)	1 (0)	5 (6)	2 (0)	2 (2)	2 (4)
Other dev. Africa	38 (39)	2 (1)	0 (0)	27 (30)	7 (5)	6 (5)	0 (0)	5 (6)	35 (34)	3 (1)	3 (5)	34 (34)
Oceania	5 (5)	0 (0)	0 (0)	2 (3)	2 (2)	1 (0)	0 (0)	2 (0)	3 (5)	0 (0)	1 (0)	4 (5)
West Asia	8 (11)	4 (1)	0 (0)	6 (8)	1 (1)	5 (3)	0 (0)	0 (0)	12 (12)	2 (2)	2 (0)	8 (10)
S. & South-East Asia	9 (12)	2 (2)	4 (1)	2 (4)	1 (3)	12 (8)	0 (0)	1 (3)	14 (12)	4 (2)	6 (5)	5 (8)
Caribbean	5 (5)	2 (1)	0 (1)	0 (1)	2 (3)	5 (3)	1 (1)	0 (0)	6 (6)	4 (1)	0 (0)	3 (6)
Latin America	17 (19)	2 (0)	0 (0)	5 (5)	6 (8)	8 (6)	1 (1)	3 (3)	15 (15)	2 (1)	5 (4)	12 (14)
All countries (104)	88 (97)	12 (5)	4 (2)	43 (55)	20 (24)	41 (25)	2 (2)	12 (12)	90 (90)	17 (7)	19 (16)	68 (81)

Note: Includes all developing countries (104) for which consistent data are available.
* See annex II for the definition of commodities and processing stages as well as for a discussion of the implication of this definition for measuring dependence.

Source: UNCTAD database.

20. One question often raised about the limited success in export diversification concerns the effects of protectionism, particularly tariff and non-tariff barriers (NTBs) in the developed countries, on developing countries' diversification experience. Table 3 shows the post-Tokyo Round import tariffs applied in the European Union (EU), Japan and the United States of America. The effects of special arrangements between exporting developing countries and importing developed countries are responsible for the differences between most-favored nation (MFN) tariffs and actual tariffs. The table shows that there are large disparities in tariffs and that food items, as well as low-technology processed goods, such as textiles, clothing and footwear, have tariffs above the average for all products.[20] In the light of this tariff pattern, it may be surprising that many developing countries that have successfully diversified their export structure have done so by moving into those products, as shown below.

21. Regarding the incidence of import tariffs distributed by countries of origin, Erzan and Svedberg (1991) compare the average duty paid on imports from sub-Saharan Africa (i.e. the region with the least success in export diversification) in each of the main industrialized country markets with that: (a) actually paid on imports from all developing countries taken together; and (b) which would be paid on the same set of goods imported from all developing countries taken together; the latter procedure allows removing apparent preferential margins due to differences in the product mix of the two groups of countries. Table 4 shows that exports from sub-Saharan Africa had tariffs lower than those for all developing countries in all three of the main developed country markets; it also shows that these countries' average preference margin was the highest in the United States of America, followed by Japan.

22. Given that the post-war multilateral negotiations achieved a significant reduction of tariffs for industrialized countries and therefore that tariffs, especially those on primary products, have been relatively low in developed market economies over the last few years, the critical area for market access barriers is the incidence of NTBs (discussed below in this section) as well as that of tariff escalation (discussed in section B). Since the GATT system has imposed restrictions on the allowed level of tariffs and on discrimination among suppliers, governments of developed economies have increasingly responded to domestic protectionist pressures by resorting to NTBs. The key characteristics of NTBs that distinguish them from tariff measures include: (a) the associated introduction of selectivity into the trading system; (b) the absence of legal requirements for reporting and thus the lack of transparency in the application of the NTBs; and (c) their greater variability and ease of change that create uncertainty that serves as a deterrent to trade (Page, 1994, pp. 42-44).

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[20] Average tariffs are not a reliable indicator of tariffs faced by developing countries since by definition they do not indicate tariffs by provenance. It could be that lower-than-average tariffs are applied only to goods coming from developed country suppliers. Also, average tariffs do not take into account quality differences within their classification.

Table 3: Post-Tokyo Round, applied, and Generalized System of Preferences (GSP) tariffs in the European Economic Community, Japan, the United States of America and all developed countries
(percentages)

Product group	MFN tariffs				Average tariffs applied				GSP tariffs			
	EEC	Japan	United States	All developed countries	EEC	Japan	United States	All developed	EEC	Japan	United States	All developed countries
All food items	3.7	9.7	4.1	6.4	4.4	9.4	3.5	5.3	5.0	11.1	3.6	5.5
Food and live animals	3.2	10.0	3.8	6.5	4.8	9.7	3.2	5.3	5.1	11.7	3.4	5.6
Oilseeds and nuts	10.3	5.6	1.4	5.3	4.9	4.8	1.0	4.0	6.2	5.0	0.3	4.5
Animal and veget. oils	0.1	0.3	0.9	0.1	0.0	0.3	1.0	0.2	0.0	1.2	0.1	0.4
Agricultural raw materials	3.4	0.7	0.3	0.8	0.4	0.3	0.3	0.5	0.5	0.5	0.1	0.5
Ores and metals	2.8	2.5	1.9	2.3	0.7	1.8	2.2	1.5	0.5	1.3	1.1	0.9
Iron and steel	5.5	5.0	4.3	5.1	2.3	2.9	5.0	3.4	3.3	2.0	3.5	3.0
Nonferrous metals	3.2	5.5	0.7	2.3	0.5	4.3	0.7	1.3	0.5	3.1	0.3	1.1
Fuels	0.1	1.5	0.4	1.1	0.3	1.2	0.4	0.6	0.2	1.3	0.3	0.6
Chemicals	8.4	5.5	3.7	5.8	3.4	4.8	3.9	3.1	4.1	5.1	1.0	3.7
Manufactures excl. chem.	8.1	5.7	5.6	7.0	4.6	4.6	4.9	4.7	6.4	4.2	6.6	6.7
Leather	10.2	11.9	4.2	5.1	2.1	10.7	2.7	3.1	2.8	8.4	1.4	3.2
Textile yarn and fabrics	17.3	8.6	10.6	11.7	5.3	7.1	12.1	7.9	7.6	6.1	9.0	8.4
Clothing	19.9	15.0	20.3	17.5	7.3	10.0	18.1	11.9	9.3	8.6	17.8	14.6
Footwear	22.5	14.2	11.7	13.4	6.5	12.5	9.5	9.0	9.1	7.9	9.4	10.1
Other items	4.8	2.3	n.a.	n.a.	0.1	0.7	3.6	3.3	0.1	1.0	0.4	3.8
All products	4.2	3.5	3.9	4.7	2.5	3.1	3.8	3.0	2.1	2.3	3.6	2.7
Developing country weights	3.2	3.0	4.9	n.a.	2.1	2.4	4.5	n.a.	2.1	2.3	3.6	2.7

Source: Laird and Yeats, 1987, pp. 94-95.

Table 4: Trade-weighted average tariffs for by sub-Saharan Africa (SSA) and all developing countries in the EEC, Japan and the United States of America (all products, excluding fuels) (percentages) [a]

Exporter	Market		
	EEC	Japan	United States
SSA	0.01	1.64	0.48
All developing countries	1.76	4.03	6.67
(for same products as SSA[b])	(1.75)	(1.71)	(6.63)

Notes: [a] The averages are based on actual tariffs for by individual countries, including preference margins, in 1983. Weights also pertain to actual 1983 data.
[b] Average for all developing countries, but restricted to the list of products exported by SSA to the relevant markets - using aggregate trade weights of all developing countries.

Source: Erzan and Svedberg, 1991, p. 108.

23. The effect of NTBs is usually measured by the trade-coverage ratio, which measures the percentage of imports (in value terms) affected by NTBs and the frequency ratio, which indicates the percentage of products affected by NTBs. This percentage is usually calculated as the ratio of tariff lines covered by NTBs to total tariff lines. Both ratios pose a problem of measurement in so far as they indicate that trade is not affected at all when an import barrier is prohibitive. Table 5 shows that the frequency ratio for imports from developing countries is higher than that for developed market economies in all three markets, while the value of imports affected by NTBs for developed countries is higher than the value of imports for developing countries in the markets of Japan and the United States of America. This feature points to the greater variety of exports from developed countries and to the high value of trade within the European Union (EU). The table also suggests that developing Africa enjoys substantial preferential margins in the markets of the EU (sub-Saharan Africa enjoys higher preferential margins than developing Africa as a group because of the preferences accorded to signatories of the Lomé Convention) and the United States of America, while developing Africa faces higher NTBs in Japan than do other developing countries. However, Erzan and Svedberg (1991, p. 109) point out that import authorization, which usually is not a restrictive barrier, figures predominantly among the NTBs used by Japan against imports from sub-Saharan Africa.

24. The table further suggests that developing Asia (i.e. the most successful country group in terms of export diversification) has the highest NTBs in the markets of the EU and the United States of America for the majority of individual

sectors in these markets. However, developing Asia enjoys preferential margins in market access to Japan. Regarding the implications of protection in developed market economies for export diversification in developing countries, it is concluded that, while a negative impact of protection on diversification cannot be ruled out, there is little evidence that protection is a main cause of the limitations in export diversification in sub-Saharan Africa *relative* to other developing countries. Combining this finding with the data in figures 3 to 6, it may be argued that supply problems, for example, low productivity and a low level of technological and managerial capabilities, played a significant role regarding limitations in export diversification in sub-Saharan Africa.[21]

25. Food, steel (listed under 'ores and metals'), textiles and clothing are usually the individual economic sectors most affected by NTBs, which may partly reflect the fact that these goods have been important in world trade. The NTB coverage of imports by the United States of America and the EU reflects this general pattern, with the EU having additional controls on coal imports (listed under 'mineral fuels'). Imports of manufactures are also subject to substantial NTBs in both these countries, a feature which reflects controls on car imports. By contrast, Japan's NTBs are highest on food imports. Japan's controls on food imports were actually much higher than what is reflected in the two ratios, considering that, due to the weighting problem, the ban of rice imports was not taken into account by these measures.

26. Page (1994, pp. 55-56) analyses product-specific NTB coverage in further detail and concludes that low-technology goods have the highest barriers. Combining the evidence on the product-specific incidence of tariff and that on non-tariff barriers, she states (ibid., p. 56) that "to move out of primary products into manufactures is made more difficult (because of tariffs), and the first stage within manufactures is particularly difficult (because of NTBs). It is only later that the structure becomes increasingly favorable to more advanced countries (NTB de-escalation). It would probably be wrong, however, to assume that this cross-section difference could be applied over time: the spread of controls from textiles to clothing and from primary goods in general to manufactures shows that present exporters of low technology goods cannot assume that they rely on open markets in higher technology goods when they reach that stage." On the other hand, there are three factors that underline the importance of improving productivity and of managerial and technological capabilities, if export diversification is to suceed. These are: the current pattern of protectionism; the fact that this pattern is unlikely to change in the near future; and that countries from East Asia have succesfully diversified their export structure at a time when other developing countries enjoyed preferential access to the markets of developed economies.

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[21] Erzan and Svedberg (1991, p. 101) provide further support to this argument by looking at the evolution of import patterns in the main developed market economies and of market destination of exports from developing countries. They show that by the mid-1980s, the United States of America had taken over the role of the EEC in terms of being the largest importer of non-oil exports from developing countries. Given that the rate of growth in the United States of America market for developing country exports was double that in the EEC and that petroleum accounted for most of the increase in exports from sub-Saharan Africa to the United States of America, they conclude (ibid.) "that sub-Saharan Africa did not have the 'right' products to exploit the potential in the fast-growing US market for labour-intensive manufactures" such as textiles, clothing and footwear.

Table 5: Frequency and trade-coverage ratios of non-tariff barriers for exporting countries in the EEC, Japan and the United States of America, (percentages)

Sector	Exporter	Market					
		EEC		Japan		United States	
		Frequency ratio	Trade-coverage ratio	Frequency ratio	Trade-coverage ratio	Frequency ratio	Trade-coverage ratio
Food	DMECs	43.4	42.0	41.8	49.3	9.8	30.0
	Developing countr.	30.7	27.5	51.2	56.3	4.6	10.6
	Developing Africa	25.0	25.8	63.3	74.7	4.3	8.9
	Sub-Saharan Afr.	19.5	20.2	64.0	67.8	4.3	9.2
	Developing Asia	31.7	31.7	49.4	58.8	4.0	14.0
	Develop. America	34.5	27.0	52.0	38.6	5.3	9.3
Agricultural raw materials	DMECs	3.1	1.4	14.4	1.7	2.1	0.4
	Developing countr.	4.0	3.9	20.0	6.0	2.6	7.0
	Developing Africa	2.7	2.8	27.2	6.7	1.7	0.3
	Sub Saharan Afr.	2.3	2.6	26.1	14.2	1.7	0.3
	Developing Asia	3.4	3.3	18.3	6.0	2.8	3.6
	Develop. America	6.4	6.9	20.0	6.0	2.9	13.4
Ores and metals	DMECs	29.5	22.1	0.2	0.9	33.0	28.4
	Developing countr.	21.4	15.4	0.2	0.6	20.1	24.1
	Developing Africa	13.8	6.0	0.0	0.0	0.0	0.0
	Sub-Saharan Afr.	8.7	4.7	0.0	0.0	0.0	0.0
	Developing Asia	17.0	20.6	0.2	0.0	15.3	36.6
	Develop. America	31.1	11.4	0.3	1.8	2.9	13.4
Mineral fuels	DMECs	5.8	10.4	10.0	76.8	3.3	11.8
	Developing countr.	18.2	33.0	9.0	2.4	6.2	4.4
	Developing Africa	23.5	34.6	6.3	0.4	2.0	0.1
	Sub-Saharan Afr.	17.1	47.5	20.0	2.6	0.0	0.0
	Developing Asia	19.4	29.1	9.3	2.4	6.6	2.6
	Develop. America	12.9	47.6	9.1	1.4	27.8	23.0
Textiles	DMECs	19.2	14.1	0.0	0.0	7.9	20.8
	Developing countr.	76.8	78.6	2.4	7.3	61.4	75.7
	Developing Africa	45.0	55.9	0.0	0.0	13.4	69.7
	Sub-Saharan Afr.	29.7	37.8	0.0	0.0	3.3	38.2
	Developing Asia	80.0	78.7	2.7	7.5	74.7	78.9
	Develop. America	84.3	92.5	0.0	0.0	48.1	62.3
Apparel and clothing	DMECs	21.1	11.6	0.0	0.0	6.0	7.0
	Developing countr.	69.3	76.7	0.0	0.0	57.4	84.3
	Developing Africa	29.8	47.5	0.0	0.0	12.0	61.0
	Sub-Saharan Afr.	24.5	39.1	0.0	0.0	18.4	76.6
	Developing Asia	77.6	80.6	0.0	0.0	77.3	88.3
	Develop. America	62.9	54.7	0.0	0.0	36.3	60.7
Manufactures (excl. chem.)	DMECs	9.8	12.1	0.8	0.3	3.3	31.4
	Developing countr.	28.1	36.9	1.2	1.2	19.5	25.1
	Developing Africa	16.6	34.4	0.0	0.0	4.4	26.2
	Sub-Saharan Afr.	9.4	23.1	0.0	0.0	4.0	25.4
	Developing Asia	30.9	38.5	1.1	1.2	24.8	29.1
	Develop. America	24.3	27.5	2.3	0.4	13.7	11.9
All sectors	DMECs	12.5	13.3	5.7	16.4	5.5	27.4
	Developing countr.	25.7	29.9	9.8	10.1	15.9	18.9
	Developing Africa	16.6	27.2	22.6	25.8	3.9	1.9
	Sub-Saharan Afr.	10.7	23.3	26.9	28.1	3.6	1.9
	Developing Asia	28.4	33.2	8.2	9.5	20.2	24.7
	Develop. America	23.2	23.0	15.7	11.8	11.4	12.0

Notes: (1) The broad group of NTBs used in the analysis includes tariff quotas, increased tariffs, anti-dumping and countervailing actions, variable levies, quantitative restrictions, the surveillance of quantities and/or prices of imports and various types of licensing. Health and safety regulations, technical standards and excise taxes are excluded. While data on NTBs pertain to 1990, trade data employed to calculate frequency and trade-coverage ratios are from 1988 for Japan and the European Economic Community, and from 1989 for the United States of America.
(2) Sectors are defined in Standard International Trade Classification (SITC) as the following: food = SITC 0+1+22+4; agricultural raw materials = SITC 2 less (22+27+28); ore and metals = SITC 27+28+67+68; mineral fuels = SITC 3; manufactures excluding chemicals = SITC 6 to 8 less (67+68); all sectors = SITC 0-9.
(3) The frequency ratio gives the number of trade flows covered by NTBs as a share of the total number of trade flows, where the number of trade flows is the number of national tariff lines.
(4) The trade coverage ratio measures the value of imports affected by selected NTBs as a share of all imports.
(5) Figures for the European Economic Community include country-specific measures in addition to common EEC-measures.
(6) DMECs = developed market economies; developing countries = all developing countries including China, developing Europe (excluding Central and Eastern European countries) and Oceania. Developing Asia = developing countries from West, South and South-East Asia.

Source: UNCTAD database on trade control measures.

B. Vertical diversification

27. Raising the value-added included in a country's exports through the domestic processing of raw materials has often been the objective of measures designed to foster vertical diversification. Policy makers, in general, may find it necessary to weigh the rise in employment and the value-added gained from the processing of raw materials against the cost and effort involved in acquiring the capital, skill, technology and supplementary inputs needed for processing projects. According to traditional trade theory, developing countries have a comparative advantage in labour-intensive activities and therefore may be able to establish processing activities in an internationally competitive manner if they are labour intensive. Developing countries would have a comparative advantage in capital-intensive processing activities only if the higher transport costs involved in the trade of some commodities in unprocessed form[22] are outweighed by the relatively higher costs of capital. By contrast, developing countries will not have a comparative advantage in labour-intensive processing activities, for example, when the cost advantage in labour input is outweighed by a cost disadvantage regarding secondary inputs,[23] infrastructural facilities or skilled manpower.

28. The data in table 6 suggest that few developing countries have been successful in moving up the processing chain for their commodity exports and that those which have been successful have, in general, not engaged in capital-, technology- or skill-intensive activities. The group of successful developing countries outside Africa includes Argentina (soybean cake and oil), Brazil (soybean cake and oil, orange juice and steel), Indonesia (plywood, processed cocoa products), Malaysia (processed rubber, cocoa products), Samoa (coconut cake and oil), and Thailand (fisheries preparations).[24]

29. It is interesting to note that a crucial element of Indonesia's success in raising its exports of plywood was that most of the marketing expertise was provided by foreign investors and the marketing itself was done by them.[25] By

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[22] For copper as for other non-ferrous metals except aluminium, smelting near the mine considerably reduces the weight as about two thirds of the ore concentrates are waste material. The weight reduction in going from unrefined to refined copper is, by contrast, negligible. For aluminium, the weight can be halved by producing alumina from bauxite and halved again by producing aluminium ingots from alumina. Handling aluminium ingots can be more costly than handling a bulk cargo like alumina (a powder), which may neutralize the cost advantage of the lower weight; on the other hand, alumina is highly sensitive to moisture and is considered a pollutant so that it is usually transported in specially equipped ships and unloaded with special port-handling facilities.

[23] Processing of bauxite or iron ore, for example, requires substantial inputs of energy. Natural rubber is produced only in developing countries but most of it is used in combination with synthetic rubber. This means that exports of processed rubber products are possible only if synthetic rubber is imported or produced alongside natural rubber.

[24] Although some of the fuel-exporting countries in West Asia have successfully diversified their exports into energy-intensive processed forms of metals, they are still very dependent on fuel exports.

[25] There is disagreement as to the economic effects of the ban on exporting logs. The World Bank argues that by diverting export sales of the resource onto the home market, export restrictions lower the resource's domestic price. This

contrast, attempts by the Solomon Islands and Papua New Guinea to export timber in processed form have failed. Both countries have a great potential in this sector at present, as logs account for the bulk of their wood exports.[26] However, processors have installed sawing mills on each concession, regardless of location, species composition and stand density. This was done in order to comply with statutory requirements to export a certain percentage of wood in processed forms, instead of installing mills in selected locations with a view to processing wood, in an economically efficient manner, of the quality required for export. This inappropriate choice of location has led to low efficiency of processing units and poor quality of wood products, resulting in low competitiveness of processed wood from these countries on the world market.[27]

30. Regarding processing into the production of steel, which many policy makers have considered essential for balanced industrial development, production has been located in developing countries such as the Republic of Korea, Brazil, Taiwan Province of China, Mexico and Turkey where steel has been produced for the domestic market. Brazil's apparent success in moving up the processing chain in its exports from the iron ore/steel sector may hence have to be assessed against the background of the slow-down in economic activity in Brazil during the 1980s; in other words, exports were increased as a vent for surplus. However, as a reaction to the growing share of the Republic of Korea and Brazil in the world steel market, industrialized countries considerably intensified protective measures, raising some doubts as to the growth potential of steel exports from these countries.[28]

31. In a few cases, including Côte d'Ivoire (fisheries, wood), Senegal (fisheries), Cameroon, Congo, and Ghana (wood), sub-Saharan African countries

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lowered price benefits processors. However, the government ran the risk of encouraging inefficient industries which may become permanently dependent on government support. Moreover, the effect of the decline in the domestic price could be divided into the gain accruing to processors and a dead weight loss. This loss has been estimated as being equivalent, in the mid-1980s, to US$4 in lost log exports for every dollar gained in plywood exports and an accumulated total loss of US$2-3 billion up to 1987. Government officials see such calculations as "an accountant's tabulation with no reference to actual market conditions". They argue that continuing to supply the world market with logs at previous logging rates would have created a surplus resulting in depressed prices and a waste in natural resources. See GATT, 1991, p. 178.

[26] The sustainability of these countries' wood exports in environmental terms is, however, questionable.

[27] For details regarding problems in exporting processed wood from the Solomon Islands, see UNCTAD, 1995a.

[28] Steel exporters from Brazil were 'competitive' on the world market as they were ready to sell at the prevailing world market price, irrespective of whether that translated into a loss or a surplus on steel production. Given the global overcapacity in steel production in the mid-1980s, other steel-producing and steel-exporting countries had similar problems. Therefore, the United States of America, for example, encouraged countries exporting steel to the United States to agree to Voluntary Export Restraint Agreements, while countries in the European Economic Community raised subsidies for steel production. For details on developments in the steel industry during the 1980s, see UNCTAD, 1990.

Table 6 : Share of main commodities [a/] in developing countries' total earnings from marchandises exports (percentages of nominal US dollar values)

Country/territory[b/]	1989-1991 (average)	1979-1981 (average)
Latin America		
Argentina (76)	soya beans/cake/oil 17%, cereals 11%, meat 7%, steel 7%, sunflower 6%	cereals 24%, meat 13%, soya beans 9%, hides/leather 7%
Belize (87)	sugar 37%, garments 15%, fruits 14%, fisheries 5%, dairy products 5%	sugar 38%, garments 9%, fruits 6%, fisheries 5%
Bolivia (93)	gas 25%, zinc 16%, tin 14%, silver 12%	tin 38%, gas 22%, silver 8%, zinc 4%
Brazil (67)	iron/steel 19%, soya beans/cake/oil 9%, coffee 5%, leather/footwear 5%, fruits 4%	coffee 12%, soya beans 12%, iron/steel 12%, sugar 5%, leather/footwear 4%
Chile (89)	copper 47%, fisheries 11%, fruits 10%, wood pulp 7%	copper 44%, fisheries 7%, wood pulp 6%, fruits 4%
Colombia (89)	petroleum 24%, coffee 24%, coal 8%, cotton/textiles 6%, fruits 5%, flowers 4%	coffee 58%, cotton/textiles 7%, fruits 3%, cut flowers 3%
Costa Rica (86)	fruits 29%, coffee 19%, gold 9%, textiles 5%, flowers 4%, meat 4%	coffee 27%, bananas 22%, meat 8%, textiles 4%
Ecuador (94)	petroleum 44%, bananas 19%, fisheries 19%, coffee 6%, cocoa 4%	petroleum 61%, cocoa 9%, bananas 8%, coffee 8%, fisheries 7%
Guatemala (79)	coffee 30%, sugar 12%, cotton/textiles 8%, bananas 8%	coffee 30%, cotton/textiles 12%, sugar 6%, bananas 4%
Guyana (89)	sugar 37%, bauxite/aluminium 31%, fisheries 9%, rice 6%, gold 4%	bauxite/aluminium 42%, sugar 29%, rice 9%, fisheries 4%
Honduras (88)	fruits 47%, coffee 21%, fisheries 6%, wood 4%, meat 3%	fruits 30%, coffee 25%, meat 7%, wood 7%
Mexico (58)	petroleum 34%, vegetables 3%, steel 3%, coffee 2%	petroleum 58%, coffee 4%, fisheries 4%, vegetables 3%
Nicaragua (94)	coffee 25%, meat 15%, cotton 15%, sugar 10%, bananas 9%	coffee 31%, cotton 17%, meat 11%, sugar 7%
Panama (78)	fruits 32%, fisheries 24%, sugar 7%, coffee 4%	petroleum 24%, bananas 20%, sugar 15%, fisheries 3%
Paraguay (91)	cotton 35%, soya 29%, meat 10%, wood 3%	cotton 36%, soya beans 21%, wood 19%
Peru (73)	copper 18%, fisheries 17%, zinc 10%, petroleum 7%, cotton/textiles 6%	petroleum 17%, copper 15%, fisheries 9%, zinc 5%, cotton/fabrics 4%
Suriname (89)	bauxite/aluminium 81%, rice 5%, bananas 2%	bauxite/aluminium 78%, rice 8%, wood 2%, bananas 1%
Uruguay (80)	wool/textiles 16%, meat 14%, hides/leather 12%, cereals 10%	meat 20%, wool/textiles 14%, hides/leather 12%, cereals 9%
Venezuela (93)	petroleum 78%, aluminum 5%, iron/steel 5%	petroleum 90%, iron/steel 2%, aluminum 2%
Caribbean		
Barbados (63)	petroleum 24%, sugar 16%, textiles 5%, alc. beverages 4%, wood pulp 3%	sugar 21%, textiles 9%, alcoholic beverages 1%
Cuba (86)	sugar 74%, nickel 5%, fisheries 2%, fruits 2%, petroleum 1%	sugar 83%, nickel 5%, fisheries 2%, fruits 1%, petroleum 1%
Dominica (62)	fruits 57%, coconut oil 1%, taro 2%, soya bean oil 1%	fruits 49%, coconut oil 5%
Dominican Rep. (93)	nickel 35%, textiles 20%, sugar 19%, coffee 6%, cocoa 5%, tobacco 2%	sugar 33%, iron ore 11%, nickel 12%, coffee 11%, cocoa 7%, tobacco 5%
Haiti (83)	textiles 44%, coffee 16%, fruits 5%, sugar 3%	coffee 30%, bauxite 11%, textiles 9%, leather 8%
Jamaica (86)	bauxite/alumina 57%, textiles 9%, sugar 7%, fruits 4%	bauxite/alumina 74%, sugar 6%, alcoholic beverages 2%
Trinidad Tobago (91)	petroleum 73%, steel 7%, fertilizers 3%, sugar 2%	petroleum 90%, sugar 1%
North Africa		
Algeria (99)	petroleum 68%, gas 30%	petroleum 90%, gas 9%
Egypt (86)	cotton/textiles 29%, petroleum 24%, aluminium 6%, fruits 2%, vegetables 2%	petroleum 56%, cotton 26%, aluminium 4%, fruits 2%, vegetables 2%
Libya (97)	petroleum 96%, gas 1%	petroleum 96%, gas 2%
Morocco (76)	fertilizers 20%, textiles 18%, fisheries 13%, fruits 6%, vegetables 3%	fertilizers 42%, fruits 12%, fisheries 6%, textiles 6%, vegetables 5%
Sudan (90)	cotton 38%, live animals 12%, sesame 11%, gum arabic 9%, groundnuts 5%	cotton 40%, groundnuts 13%, cereals 11%, gum arabic 7%, animals 6%
Tunisia (75)	textiles 30%, petroleum 17%, fertilizers 9%, olive oil 5%, fisheries 3%	petroleum 57%, fertilizers 13%, texiles 10%, olive oil 4%

Table 6 : Share of main commodities [a/] in developing countries' total earnings from marchandises exports
(percentages of nominal US dollar values)

Country/territory[b/]	1989-1991 (average)	1979-1981 (average)
Africa, other		
Angola (92)	petroleum 84%, precious stones 7%, gas 1%	petroleum 76%, precious stones 11%, coffee 9%
Benin (99)	cotton 57%, petroleum 16%, wheat flour 6%, cotton seed 6%, palm kernels/oil 3%	palm kernels/oil 25%, cocoa 24%, cotton 18%, groundnuts 3%
Botswana (98)	precious stones 76%, nickel 12%, meat 6%, copper 3%	precious stones 51%, nickel 21%, meat 16%, copper 5%
Burkina Faso (92)	cotton 51%, gold 21%, live animals 16%, hides 4%	cotton 40%, live animals 22%, hides 5%, rubber tires 4%
Burundi (95)	coffee 70%, gold 12%, tea 8%, hides 4%, crude material 2%	coffee 75%, precious stones 6%, gold 6%, tea 2%, crude mat. 2%, hides 1%
Cameroon (92)	petrol. 22%, coffee 13%, wood 11%, aluminum 7%, cocoa 11%, cotton/fab. 7%	petr. 29%, coffee 21%, cocoa 21%, wood 12%, aluminium 4%, cot./fabr. 4%
Cape Verde (97)	fisheries 50%, bananas 32%, hides 1%	fisheries 38%, crude minerals 19%, bananas 15%, vegetables 15%
Central Afr. Rep. (97)	precious stones 38%, wood 22%, coffee 14%, animals 14%, cotton 14%, gum arabic 7%	precious stones 29%, wood 28%, coffee 18%, cotton 12%, gum arabic 4%
Chad (90)	cotton 48%, live animals 20%, crude material 18%	cotton/textiles 63%, live animals 30%, hides 2%
Comoros (97)	spices 72%, petroleum 15% uranium 8%	spices 77%, copra 5%
Congo (99)	petroleum 85%, wood 10%, precious stones 2%	petroleum 84%, wood 7%, precious stones 4%
Côte d'Ivoire (74)	cocoa 33%, coffee 11%, wood 9%, fisheries 5%, cotton 4%, fruits 3%,	cocoa 31%, coffee 24%, wood 16%, petroleum 5%, cotton 4%, fisheries 3%
Equat. Guinea (91)	wood 45%, cocoa 33%, precious stones 2%, coffee 1%	cocoa 79%, wood 15%, coffee 3%
Ethiopia (93)	coffee 65%, hides 16%, vegetables 2%, crude material 2%	coffee 64%, hides 14%, petroleum 7%, vegetables 3%, crude material 2%
Gabon (98)	petroleum 77%, wood 12%, manganese 7%	petroleum 77%, wood 7%, manganese 6%, uranium 6%
Gambia (97)	precious. stones 37%, groundnuts/cake/oil 26%, fisheries 11%, gold 5%, cotton 4%	groundnuts/cake/oil 66%, fisheries 9%, gold 2%
Ghana (92)	cocoa 37%, gold 25%, wood 13%, bauxite/alum. 10%, precious stones 6%, fish. 2%	cocoa 59%, gold 13%, bauxite/aluminium 13%, fisheries 5%, wood 3%
Guinea (96)	bauxite/alumina 82%, precious stones 8%, cereals 3%, live animals 2%, coffee 1%	bauxite/alumina 91%, live animals 2%, coffee 2%
Guinea-Bissau (95)	cashew nuts 58%, fisheries 10%, wood 7%, cotton 5%, palm kernels/oil 4%	fish. 31%, groundnuts 29%, palm k./oil 19%, cotton 10%, cashew nuts 6%
Kenya (85)	tea 26%, coffee 19%, petroleum 12%, flowers 5%, fruits 5%, vegetables 3%	petroleum 27%, coffee 23%, tea 14%, flowers 3%, hides 3%
Liberia (98)	iron ore 52%, rubber 24%, wood 21%, coffee 1%	iron ore 57%, rubber 16%, wood 13%, crude minerals 6%, coffee 5%
Madagascar (78)	spices 25%, coffee 15%, fisheries 14%, sugar 7%, crude minerals 5%	coffee 44%, spices 22%, fisheries 5%, meat 4%, sugar 3%, cotton fabr. 3%
Malawi (92)	tobacco 68%, tea 11%, sugar 7%, cotton 2%, coffee 2%	tobacco 47%, sugar 17%, tea 14%, groundnuts 6%, cotton 5%
Mali (94)	cotton 47%, live animals 25%, gold 7%, precious stones 2%, groundnut oil 2%	live animals 50%, cotton 34%, gold 8%, groundnut oil 4%
Mauritania (90)	iron ore 44%, fisheries 32%, live animals 8%, petroleum 6%	iron ore 71%, live animals 18%, fisheries 8%
Mauritius (90)	textiles 53%, sugar 31%, precious stones 2%, fisheries 1%	sugar 66%, textiles 21%, tea 2%, fisheries 1%, precious stones 1%
Niger (95)	uranium 73%, live animals 15%, vegetables 3%, tobacco 2%	uranium 84%, live animals 9%, vegetables 2%, cereals 2%
Nigeria (98)	petroleum 95%, cocoa 1%, rubber 1%	petroleum 92%, cocoa 2%
Rwanda (94)	coffee 65%, tea 20%, crude material 3%, hides 3%, tin 2%, tungsten 1%	coffee 63%, tea 10%, tungsten 5%, tin 5%, crude material 3%, hides 2%
Sao Tome & Pri. (68)	cocoa 59%, copra 6%	cocoa 86%, copra 6%
Senegal (89)	fisheries 31%, groundnuts 22%, petroleum 13%, fertilizers 11%	groundnuts/cake/oil 26%, fisheries 20%, petroleum 20%, fertilizers 17%
Seychelles (96)	fisheries 88%, copra 3%, spices 1%	copra 63%, fisheries 23%, spices 7%
Sierra Leone (94)	precious stones 34%, bauxite 19%, rutile 15%, fisheries 9%, cocoa 7% coffee 5%	precious stones 42%, coffee 14%, cocoa 11%, rutile 10%, bauxite 6%, fish. 3%
Somalia (98)	live animals 55%, bananas 21%, fisheries 14%, hides 3%, crude material 2%	live animals 80%, bananas 9%, hides 5%, crude material 2%
Togo (91)	fertilizers 48%, cotton 17%, coffee 7%, cocoa 4%, cereals 4%	fertilizers 45%, cocoa 14%, petroleum 13%, coffee 10%, cotton 5%
Uganda (99)	coffee 84%, cotton 4%, sesame 3%, tea 2%	coffee 97%, cotton 1%
U. Rep. ofTanzania (99)	coffee 26%, cotton 24%, tea 6%, tob. 5%, spices 5%, veget. 5%, gold 5%, fruits 4%	coffee 28%, cotton 11%, spices 10%, cashew nuts 6%, sisal 6%, tea 4%
Zaire (95)	copper 47%, petroleum 16%, cobalt 11%, precious stones 11%, coffee 8%	copper 50%, petroleum 15%, cobalt 11%, coffee 9%
Zambia (96)	copper 84%, cobalt 7%, precious stones 2%	copper 92%, cobalt 2%
Zimbabwe (82)	tobacco 30%, iron ore 12%, nickel 8%, gold 7%, cotton 7%, cereals 5%	tobacco 15%, cotton 8%, iron ore 8%, nickel 5%, sugar 4%

Table 6 : Share of main commodities [a/] in developing countries' total earnings from marchandises exports (percentages of nominal US dollar values)

Country/territory[b/]	1989-1991 (average)	1979-1981 (average)
West Asia		
Bahrain (89)	petroleum 82%, aluminium 6%, gas 1%	petroleum 86%, aluminium 4%, gas 1%
Cyprus (55)	textiles 20%, cigars 8%, fruits 7%, vegetables 7%, footwear 5%	textiles 16%, fruits 11%, footwear 9%, vegetables 9%, cigars 5%
Iran (Islamic Rep. of) (99)	petroleum 95%, carpets 4%	petroleum 94%, carpets 3%
Iraq (99)	petroleum 97%, fruits 2%	petroleum 98%
Jordan (55)	fertilizers 33%, vegetables 5%, dairy products 2%	fertilizers 24%, vegetables 11%, wood 5%, cereals 5%, spices 4%
Kuwait (86)	petroleum 83%, fisheries 1%	petroleum 85%, gas 3%
Oman (93)	petroleum 89%, copper 1%	petroleum 92%, tobacco 1%
Qatar (87)	petroleum 77%, gas 4%, steel 4%	petroleum 90%, steel 3%, fertilizers 2%, gas 2%
Saudi Arabia (93)	petroleum 88%, gas 4%	petroleum 95%, gas 2%
Syrian Arab Rep. (67)	petroleum 40%, cotton/textiles 12%, live animals 5%, vegetables 3%, phosph. 1%	petroleum 76%, cotton 11%, phosphates 2%, vegetables 1%
Turkey (68)	cotton/text. 26%, steel 11%, tobacco 4%, cereals 3%, veg. 3%, nuts 3%, fruits 3%	cotton/yarn 18%, nuts 12%, fruits 9%, tobacco 8%, veget. 5%, cereals 4%
Un. Arab Emir. (81)	petroleum 72%, gas 6%, aluminium 2%, cereals 1%	petroleum 85%, gas 2%, cereals 1%
South and Southeast Asia		
Afghanistan (81)	fruits 34%, carpets 16%, hides 14%, nuts 8%, crude materials 4%	fruits 29%, gas 29%, carpets 10%, hides 8%, cotton 6%
Bangladesh (86)	textiles 42%, jute/jute products 25%, fisheries 11%, leather 6%, tea 2%	jute/jute products 69%, leather 10%, tea 6%, fisheries 5%
Brunei Darussalam (96)	petroleum 50%, gas 45%	petroleum 64%, gas 33%
Hong Kong (18)	cotton fabrics/textiles 13%, gold/silverware 1%	cotton fabrics/textiles 28%, crude material 1%
India (67)	cotton/textiles 18%, gemstones 17%, iron ore 4%, tea 3%, leather 3%	cotton/textiles 12%, gemstones 7%, leather 6%, tea 6%, iron ore 5%
Indonesia (83)	petrol. 22%, wood 15%, gas 13%, textiles 6%, rubber 4%, fish. 4%, footwear 3%	petroleum 55%, gas 12%, wood 8%, rubber 5%
Rep. of Korea (34)	textiles 14%, footwear 6%, steel 5%	textiles 18%, steel 8%, footwear 7%, fisheries 4%
Malaysia (48)	petroleum 12%, wood 11%, palm oil 7%, textiles 6%, rubber 4%	petrol. 19%, wood 17%, rubber 16%, palm oil 11%, tin 9%, textiles 3%
Maldives (97)	fisheries 72%, textiles 24%	fisheries 83%, textiles 11%
Nepal (84)	carpets 38%, textiles 26%, jute/jute products 4%, hides 4%	jute/jute products 22%, hides 17%, cereals 13%, wood 11%, carpets 6%
Pakistan (80)	cotton/textiles 60%, rice 6%, leather 5%, carpets 4%	cotton/textiles 33%, rice 17%, carpets 8%, leather 5%, petroleum 5%
Philippines (49)	textiles 13%, copra/coconuts/cake/oil 6%, wood 6%, copper 5%	copra/coconuts/cake/oil 19%, copper 9%, sugar 10%
Singapore (26)	petroleum 17%, textiles 2%, wood 1%	petroleum 28%, wood 3%, palm oil 2%
Sri Lanka (91)	textiles 40%, tea 24%, prec. stones 9%, rubber 4%	tea 36%, rubber 15%, petroleum 12%, textiles 11%
Thailand (63)	cot./textiles 14%, fisheries 10%, rice 6%, rubber 5%, vegetables 5%, footwear 3%	rice 16%, vegetables 12%, rubber 9%, cot./text. 6%, fisheries 6%, sugar 5%
Oceania		
Fiji (84)	sugar 37%, textiles 17%, gold 10%, fisheries 7%, wood 4%, wood pulp 4%	sugar 59%, fisheries 6%, gold 4%, coconut oil 4%, wood 1%
Nauru (96)	phosphates 95%	phosphates 96%,
Papua New Guinea (92)	gold 32%, copper 29%, coffee 10%, wood 8%	copper 33%, coffee 20%, gold 15%, cocoa 7%, copra 7%, wood 5%
Samoa (99)	copra/coconut cake/oil 28%, fruits 25%, taro 24%, wood 4%, cocoa 3%, cigars 2%	copra 50%, cocoa 21%, taro 11%, fruits 8%
Solomon Isl. (97)	fisheries 38%, wood 36%, copra 8%, palm oil 8%, cocoa 5%	fisheries 37%, wood 23%, copra 19%, palm oil 11%

[a/] See Annex II for the definition of commodities.

Note: [b/] The figures in brackets indicate the country's dependence on the entire commodity sector in 1989-1991.

Source: UNCTAD database; includes all developing countries for which consistent data are available.

also succeeded in moving up the processing chain in their commodity exports.[29] By contrast, most sub-Saharan African countries that started to export semi-processed or processed rather than unprocessed commodities did so by diversifying horizontally into the processed stage of a different commodity sector. Examples include Equatorial Guinea that reduced its raw commodity exports (mainly cocoa) from 95 per cent to 70 per cent, while raising its semi-processed exports (mainly sawn wood and veneer sheets) from 0 to 8 per cent between 1979-1981 and 1989-1991; Mauritius (going from sugar to cotton textiles) and the Seychelles (going from copra to fisheries preparations) reduced their raw commodity exports from about 70 to 35 per cent and about 95 to 20 per cent, while raising their processed commodity exports from 20 to 50 per cent and 1 to 70 per cent, respectively.

32. The minimal success of developing countries in vertical diversification is explained by the following: process-related factors, tariff escalation and barriers arising from vertically integrated industry structures. Regarding process-related obstacles, to export successfully commodities in processed form usually requires high inputs of technology and market information, as well as skilled labour for production, management and marketing. These factors may not be easily available in developing countries, and it may be costly to establish them because of the externalities involved in their use. For example, the externalities associated with a company's investing in on-the-job training of labour that then possibly moves on to a different company may prevent that investment to occur in the first place. Both the relatively high cost and the externalities involved in the use of these inputs may prevent market entry of developing countries, even for a processed product whose production is relatively labour intensive. This suggests that domestic policies are crucial for the development of a country's exports in processed form. Policies designed to overcome deficiencies in these inputs may aim at either enhancing human capital formation, adopting best-practice technology, and establishing information and marketing networks domestically, or creating an environment attractive to foreign investment which embodies the transfer of technology or information and marketing networks.

33. Moreover, most processing activities generate internal economies of scale implying the need for a significant level of output to be produced in order to be competitive on the world market. Since a large domestic market provides an outlet for the processed output, the processing activities of developing countries tend to be located in the larger middle-income countries.[30] Developing countries also find it difficult to take advantage of potential comparative advantage when the geographical location of processing activities is critical. For example, many producers of end products in the metals area need to have arm-length's access to their suppliers of processed production inputs because they often require tailor-made inputs and because they prefer doing business with

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[29] A good part of Cameroon's apparent success in wood processing can be attributed to the fact that, by law, at least 60 per cent of logs have to be processed locally. By 1991/92, however, only about 50 per cent of logs underwent domestic processing. The fact that processing equipment is quasi-obsolete and that exchange-rate overvaluation led to high expenses on required imported new equipment and spare parts resulted in missing the processing target. See H. Younes, 1993.

[30] Penetrating regional markets may be an alternative for countries with a small domestic market.

companies that are known to be reliable. Companies of developing countries can nonetheless carry on processing activities by entering into joint ventures on import markets. For example, the national copper company of Zambia (ZCCM) entered into a joint venture with the French company, Alcatel Cuivre, for a wire-rod producing plant in France.[31]

34. Regarding barriers to processing, exports of processed forms of fruits, vegetables and fisheries have often been constrained by problems in marketing owing to both the stringent quality and sanitary requirements on import markets and to the fact that new entrants to the world market compete on an unequal footing with companies with long-established information networks and brand names. Indonesia and Thailand, for example, had to back up their initial investment in an appropriate fishing fleet with efforts aimed at securing their markets through vertical integration to develop processed fishery exports. Indonesian tuna fish companies acquired the American Van Camp Seafood, which controls 20 per cent of the canned tuna market in the United States, and Thai tuna fish companies purchased the American Bumble Bee Company, the world's second largest producer and marketer of canned tuna.

35. These examples illustrate the importance of identifying market outlets for processed outputs before starting a processing project. However, the penetration and maintenance of export markets is a complex problem. Exporting countries themselves can facilitate this task by providing good market intelligence and analysis, an adequate number of personnel with marketing experience, and good storage and transport facilities, etc. On the other hand, external barriers, such as import tariffs in industrialized countries, which tend to escalate with the degree of processing, are another obstacle to exporting processed commodities. Table 7 gives some information on the escalation of nominal tariffs for a number of selected commodities.[32] Tariff escalation is defined as the tariff wedge between the processed and unprocessed or raw product. The table suggests that tariff escalation remains a barrier for the processed exports of developing countries.[33] These data show that tariff escalation has constrained

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[31] International Wrought Copper Council, 1991, p.53.

[32] For certain commodities, established trade patterns may also act as an external barrier. The major export commodities, such as coffee, cocoa, tea and tobacco, of many highly commodity-dependent developing countries, have traditionally been exported mainly in unprocessed forms because, for example, different consumer countries demand different blends of these commodities. The coffee consumed in industrialized countries, for example, usually contains coffee beans from different origins. Therefore, there seems to be little demand beyond domestic or niche markets for exports of these commodities in processed forms from individual countries. Example of niche markets include so-called "alternative trade networks", where the exported commodity is often bought in processed form directly from the producer provided that certain minimum standards with regard to safety, health and pesticide use are observed.

[33] As Johnson (1971, chapt. 12) notes, an escalation of *nominal* tariff rates with the stage of processing is required to give equal degrees of *effective* protection in the unrealistic case where "the production processes can be arranged in a chain such that each process uses as inputs only original factors of production and the output of the preceding process of the chain" (pp. 318-319). "In the general case, where commodities enter as inputs in preceding as well as succeeding processes of production ... the required .. [nominal] .. rates will depend on the specific values of the input coefficients" in order to achieve any given structure of effective rates of production (p. 320). He concludes that in "the general case, ... it is reasonable to assume that the escalation of tariff rates with stage of .. [processing] .. implies a corresponding but steeper escalation of effective rates of protection with stage of .. [processing]" (pp. 320-321).

Table 7: Trade-weighted nominal tariffs on selected product categories imported by main developed countries from developing countries, 1988, (percentages)

Product category by stage of processing	United States of America from developing countries				Japan from developing countries				European Economic Community from developing countries			
	All	Asia	America	Africa	All	Asia	America	Africa	All	Asia	America	Africa
FISHERIES												
Fresh	0.09	0.09	0.09	0.02	4.63	4.26	3.82	7.74	14.95	12.82	15.42	16.06
Oil and flour	0.24	2.51	0.06	n.a.	0.23	3.69	0.00	5.00	1.82	0.40	1.87	2.02
Preparations	7.75	8.33	2.86	7.53	14.76	14.75	14.98	15.00	22.06	21.47	19.94	24.20
SOYA												
Beans	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
Cake	2.90	2.90	2.90	n.a.	0.00	n.a.	0.00	n.a.	0.00	0.00	0.00	0.00
Oil	22.50	22.50	22.50	n.a.	22.76	22.73	22.80	n.a.	8.47	13.82	7.96	10.00
COCOA												
Beans	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	3.00	3.00
Paste etc.	0.16	0.14	0.13	0.36	18.68	28.29	11.50	3.75	13.02	12.86	14.44	12.93
Chocolate	1.10	7.00	0.79	7.00	29.48	27.84	34.90	30.00	n.a.	n.a.	n.a.	n.a.
TOBACCO												
Leaves	11.06	8.10	14.80	14.46	0.00	0.00	0.00	0.00	20.38	19.88	19.84	21.88
Products	7.50	13.58	7.18	6.70	13.46	10.83	20.06	24.20	79.48	41.06	52.01	52.74
COPPER												
Ore	4.50	n.a.	4.50	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
Unrefined	1.00	n.a.	1.00	1.00	7.30	n.a.	7.30	7.30	0.00	n.a.	0.00	0.00
Unwrought	1.00	1.00	1.00	1.00	6.50	6.50	6.50	6.50	0.00	0.00	0.00	0.00
Semis	3.48	4.34	2.54	4.01	6.56	6.56	5.98	5.33	5.65	5.15	5.90	5.60
NICKEL												
Ore	n.a.	n.a.	n.a.	n.a.	0.00	0.00	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Mattes	n.a.	n.a.	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.00	n.a.	n.a.	n.a.
Unwrought	0.00	0.00	0.00	0.00	5.50	5.52	n.a.	5.50	0.00	0.00	0.00	0.00
Semis	5.35	5.41	4.83	n.a.	5.80	5.80	n.a.	n.a.	4.60	4.60	4.60	4.59
IRON / STEEL												
Ore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Primary iron	0.00	0.00	0.00	n.a.	3.70	3.70	3.70	n.a.	3.20	3.20	3.20	n.a.
Ingots/semis	4.20	4.20	4.20	n.a.	4.30	4.30	4.30	4.30	3.18	3.12	3.20	3.15
Steel	4.61	4.20	5.10	2.57	4.92	4.93	4.91	4.90	5.70	5.93	5.54	5.12
RUBBER												
Natural	0.00	0.00	0.00	0.00	0.01	0.01	0.00	n.a.	0.00	0.00	0.00	0.00
Simple articles	3.56	3.71	3.26	0.12	4.88	4.88	4.60	n.a.	4.95	5.13	4.87	4.93
Other articles	4.29	4.48	3.79	4.00	3.31	3.34	1.51	3.36	5.60	5.58	5.90	5.57
ALUMINIUM												
Ore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unwrought	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	6.00	6.00	6.00	6.00
Semis	3.34	3.25	3.42	2.98	6.94	6.58	9.29	n.a.	10.00	10.00	10.00	10.00
HIDES / SKINS												
Hides / skins	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leather	3.79	3.83	3.75	4.25	9.64	9.79	8.88	5.47	4.08	4.50	3.84	2.49
Leather prod.	10.57	10.64	10.03	7.46	11.81	11.81	12.40	12.30	6.78	6.79	6.65	6.54
WOOD												
Raw	0.11	0.00	0.24	0.00	0.01	0.00	0.20	0.00	0.00	0.01	0.00	0.00
Sawn wood	0.00	0.00	0.00	0.00	3.67	3.57	4.82	0.00	0.12	0.14	0.06	0.14
Veneer sheets	3.31	3.43	3.24	3.20	14.63	14.61	15.00	15.00	5.94	5.68	5.97	5.99
Plywood	7.61	7.56	8.30	8.00	17.85	17.86	19.31	17.00	10.00	10.00	10.00	10.00
Semi-manufact.	5.41	5.28	5.80	4.89	4.92	4.92	6.36	4.19	5.46	5.43	5.88	5.82
Articles	3.18	3.09	2.72	2.58	4.84	4.84	4.85	4.80	5.60	5.60	5.60	5.60
COTTON												
Lint	1.59	1.51	1.68	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yarn	8.31	8.43	8.26	8.04	5.12	5.12	5.09	5.10	6.05	6.00	6.08	5.97
Fabrics	8.42	8.57	7.83	7.92	6.34	6.34	6.30	6.30	10.00	10.00	10.00	10.00
Articles	8.97	8.84	9.41	7.58	11.18	11.18	11.20	11.20	12.96	12.95	13.01	13.03
Clothing	16.88	16.79	17.14	17.48	13.85	13.85	15.51	14.77	13.62	13.61	13.51	13.68

Notes: (1) The measured tariffs are average most-favoured-nations (MFN) tariffs, where behind the average MFN-tariff applied by developed countries lies a range of different tariffs, from duty-free or zero tariff treatment to tariff peaks. In addition, bilateral trade preferences such as through the generalized system of preferences (GSP) and the Lomé Convention are not taken into account by the measured tariffs. The measured tariffs therefore overestimate the tariffs developing countries actually face.

(2) The average tariffs shown in the table use as trade weights the imports from all sources from the respective geographical region of developing countries into the respective developed economy market.

(3) Developing countries = all developing countries including China, developing Europe and Oceania; developing Asia = developing countries from West, South and South-East Asia. The fact that China and developing Oceania are included in the group of all developing countries but not in the group of developing Asia and that tariffs faced by developing Europe are not shown in the table explains why the figure for imports of tobacco products by the EEC from all developing countries is higher than those for such imports from individual regions.

(4) "n.a." means "not applicable".

(5) The tariffs shown are for 1988, except for the United States of America, for which 1989 figures are shown.

Source: UNCTAD TRAINS-database

exports in processed forms from developing to developed countries.[34] On the other hand, the development of successful processing activities in a number of developing countries suggests that concerns about such market-access constraints might have to be met with practical solutions as problems to be overcome rather than avoided or negotiated away. For example, one of the factors that allowed Malaysia to develop exports of cocoa and palm oil in processed forms was the penetration of new markets in other developing countries, instead of shying away from such activities on the grounds that markets in developed countries are protected for these products (UNCTAD, 1995c).

36. Deficiencies in domestic factors, such as, *inter alia*, the appropriateness of the policy framework, incentives, infrastructure, product quality and climate for foreign investment, as well as the availability of technological, managerial and entrepreneurial skills, could also impair the development of processed commodity exports from developing countries even where trade preferences are high.[35] For example, sub-Saharan African countries, as a group have had the least success in exporting processed commodities despite the fact that the Lomé Convention has provided tariff preferences for a wide range of their exports to the markets of the EU, and that the degree of preference has generally been greater the higher the level of processing, given that none of the African Caribbean and Pacific (Group of States) (ACP) have had tariff escalations. Products that are not included in the EU's Common Agricultural Policy and that therefore enjoy the trade preferences under the Lomé Convention include many commodities of special interest to African countries, such as bananas, cocoa, coffee, fisheries, cut flowers and wood. The fact that sub-Saharan African countries as a group have not increased their processed exports from these sectors suggests that the main difficulty lies with supply capacity. Country-specific factors, rather than tariffs, may also explain, for example, why Côte d'Ivoire and Senegal have increased their exports of canned tuna, or why Cameroon, Congo, Côte d'Ivoire and Ghana have expanded their exports of processed wood, while other countries of sub-Saharan Africa with a similar natural resource base have not. The above-mentioned success of cocoa processing in Indonesia and Malaysia further supports this argument.

37. The continuation of high tariff escalation in some sectors may be due to the large concentration in the industry and the market structure of these sectors. It would appear that the few competitors in these sectors come from developed countries and that they may find it advantageous not to push for an abolition of the tariff escalation as it helps to prevent new competitors from entering the market. Tobacco is an example; in the final instance, factors related to tobacco marketing may be responsible for the low level of processed exports achieved by developed countries in this sector.

38. This suggests that an integrated industry structure in either the import market or the world market may also constrain processing activities in developing countries. Large national as well as transnational companies (TNCs), with subsidiaries active in several different markets, often carry on either horizontally integrated processing or vertically integrated activities (from raw

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[34] Evidence on effective rates of protection given in annex III, table A4 further supports this argument.

[35] This hypothesis will be discussed in the next two parts of this series.

material processing to marketing of the final processed goods) or both. A high percentage of intra firm transactions at intermediate stages is concluded by vertically integrated firms. As a result, independent processors of intermediate goods or producers of final goods have difficulties in terms of price setting and final selling arrangements, such as exclusive dealing. The stage of processing at which a TNC actually invests will depend on its global strategy. In general, however, a TNC is unlikely to engage in activities at the level of unprocessed primary commodities, e.g. to own plantations, as doing so would unnecessarily, raise the company's global risk (for example, by being exposed to the risk of a bad harvest due to adverse weather conditions).

39. Detailed information on the nature of the barriers created by a vertically integrated industry structure suggests that most of them could be overcome by suitable regulatory measures if governments of both developed and developing countries so wish (see UNCTAD, 1984). In cases where developing country companies want to enter a vertically integrated market, there are often not many alternatives to being associated with a transnational corporation. In such cases, domestic policies regarding the conditions of investment, technology and marketing become crucial. It is, however, implausible that those developed countries and TNCs that would be most affected by successful vertical diversification in developing countries favour action to promote or encourage the relocation of processing activities to these countries. Developing countries may therefore find it necessary to stimulate their domestic industries to further processing by ensuring a steady supply of raw materials to domestic processors at the right quality and at prices that adequately reflect opportunity costs, as well as by paying special attention to their need for adequate physical infrastructure and skilled manpower. Developing countries may also try to attract TNCs to carry out processing activities by offering an attractive investment climate, including well-skilled human resources, in order to benefit from learning by doing and technology transfer.

40. To conclude, the above suggests that early stages of processing activities in developing countries have often been hampered by constraints in the access to capital, technology and skilled labour, as well as by the limited size of domestic markets that prevents developing countries from taking advantage of increasing internal economies of scale in these activities. By contrast, later stages have been constrained by marketing problems owing to the need both to satisfy stringent quality and sanitary requirements and to compete with established exporters with good information networks and recognized brand names, as well as by market-access barriers. The presence of an integrated industry structure in some commodity sectors may also have constrained processing activities in developing countries. Given that many developing countries that have been most dependent on the export of commodities in unprocessed forms have not been able to take advantage of export preferences when accorded, and that other countries, in particular those from South and South-East Asia, which have faced the same or higher tariffs, have nonetheless raised their processed commodity exports, evidence on the aggregate level, as provided in this report, leads to the hypothesis that problems with supply capacity and a lack of competitiveness in the commodity sector have been reasons for the poor performance of many developing countries in moving-up the processing chain for their commodity exports. This means that reform of national policies designed to improve economic incentives and the competitiveness of the commodity sector could be considered a condition for a better future performance by many developing countries in this area. More details on policy measures taken by

these successful countries are needed to test this hypothesis. The third part of this series of studies will come back to this issue.

C. Horizontal diversification

1. General developments

41. Developing countries may often find it easier to diversify horizontally rather than vertically. This seems to be the case for countries dependent on a few raw materials for which the opportunities for moving up the processing chain either are slim (e.g. cocoa, coffee) or require the use of technology and physical and human capital which many of these countries may not possess. In these circumstances, developing countries may try to establish export activities in basic non-traditional raw materials that can be grown under similar climatic and technological conditions as the traditional ones and be marketed in a way that the exporters are familiar with through the marketing of traditional crops. Also, developing countries may find it advantageous to diversify their export activities horizontally into a higher processing stage of a commodity for which: (a) the raw material is imported; (b) the extent of internal economies of scale is small enough to allow the new market entrants to be competitive with respect to established producers in terms of unit production costs; (c) the technology and marketing expertise is initially provided by foreign investors; and (d) the technology and marketing involved in successfully developing these activities are not too sophisticated for the domestic work force to adapt to within a short time and to spread the acquired knowledge and skills to other individuals and economic sectors.

42. Economic sectors processing low-wage, labour-intensive products have sometimes been characterized as "footloose", implying: that low wages are the primary - if not sole - determinant of those activities; that they are installed by foreign investors; that production facilities can migrate quickly once these investors perceive that the comparative advantage in this sector has shifted to another country with a similar business climate and still lower wages; and, in particular, that footloose industries provide the host country with a low net value-added and hence are only marginally beneficial to host countries. Such activities have most often involved the production and export of textiles, clothing and footwear.

43. It would, however, appear that these footloose industries have been a vital stage in achieving a more balanced export structure in a number of developing countries, in particular those in South and South-East Asia and partly in developing America, and that many successful diversifying countries have employed this kind of horizontal diversification. Its beneficial effects include: governments' recognition that there is a need for economic reform that provides the necessary incentives for the development of export activities in non-traditional economic sectors; investment, and perhaps foreign investment, in the development of efficient infrastructural facilities including ports, transportation, communication, banks and insurance; the abilities and skills the domestic workforce acquires through learning-by-doing in adapting to, or moving

closer to, best-practice technologies, managerial, financial and accounting skills, as well as marketing techniques used on international commodity markets; and the surge of domestic companies that can build a track record of successful exporting in world markets and of being a reliable counterpart. Measures related to all these aspects generate positive externalities as the facilities and capabilities created can be used by other individuals engaging in export activities in non-traditional economic sectors. Neglecting these externalities and judging such export activities only on the basis of the immediate increase in net value-added may be short-sighted and may prevent a country from fully developing its diversification potential.

44. The data in table 6 suggest that successful horizontal diversification during the 1980s was often based on the development of export activities in raw materials (e.g., fruits, vegetables, cut flowers, cereals, veneer sheets and plywood) which could be produced and exported under similar conditions as the respective countries' traditional exports and on the export of output from footloose industries (textiles, clothing, footwear). Examples of countries successful in horizontal diversification during the 1980s include Chile (fruits), Colombia (petroleum, coal and horticultural products), Costa Rica (horticultural products), Ghana (gold, wood), Kenya and the United Republic of Tanzania (horticultural products), and Uganda (cereals), as well as many countries engaged in the export of textiles and clothing.

45. Colombia's experience in horizontal diversification during the 1980s is interesting because it led to a significant reduction in its dependence on coffee exports - in contrast to many other countries that are still highly dependent on coffee exports - and also because the Government, through a diversification fund, financed the sunk costs of research and development, improvement in infrastructure, and the creation of information and marketing networks for a wide range of non-traditional commodities (e.g. sugar, cocoa, cereals, fishery, wood, fruits and vegetables). This greatly facilitated the development of export activities by the private sector, with the result that Colombia's range of commodity exports has become considerably larger.[36] Colombia's experience is an example of the beneficial impact on diversification of the Government's financing activities with public-good characteristics which involve sunk costs and whose benefits, therefore, often cannot be entirely appropriated by private investors.

46. The diversification efforts of oil-exporting countries in the context of the weakening of world-market prices for petroleum throughout the 1980s compared to those in the 1970s, and also the recession in many industrialized countries in the second half of the 1980s, are also worth noting. Table 6 suggests that during the 1980s a number of oil-exporting countries reduced their dependence on crude and/or refined petroleum exports by using their oil domestically in the energy-intensive production of other commodities. Both the United Arab Emirates and Venezuela, for example, diversified their exports into aluminium, while Trinidad and Tobago went into steel and manufactured fertilizers. Bahrain and Qatar had already diversified into aluminium exports during the 1970s.

47. Among the individual countries in Africa and developing America, which have traditionally been highly dependent on coffee exports, most African countries

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[36] For details on Colombia's diversification experience during the 1980s, see UNCTAD, 1994a.

have not diversified out of coffee, with the notable exception of Madagascar, which diversified into shell fish and sugar. The picture in developing America is also mixed. El Salvador, Guatemala and Nicaragua did not sizably reduce the share of coffee exports in their total exports, while Brazil (diversifying into footwear, steel and aluminium), Colombia (diversifying into coal, petroleum, textiles, unwrought nickel and cut flowers), Costa Rica (diversifying into fresh fish and cut flowers) and Ecuador (diversifying from petroleum into fishery products) were successful in this area.

48. The limited success of many countries of sub-Saharan Africa in diversifying out of traditional export commodities, such as cocoa and coffee, suggests that there may be barriers to exit from the production of these commodities in many of these countries. Constraints posed by climate or the natural resource base can limit diversification as it is not always easy to find crops with the same ecological requirements, the similar agro-economic characteristics and a world market of the same magnitude as for their traditional export commodity. In addition, the knowledge and tradition of growing a particular crop existing in many rural areas may make smallholder farmers reluctant to engage in new ventures. Such engagement has also been hampered by the fact that the marketing system for a traditional crop was already in place, but was not available for other commodities. Given that a central agency, such as a marketing board, used to provide externality-related services, such as market information and export marketing, for the traditional export commodities, and assuming that the marketing board used to work efficiently, there was an economic incentive for farmers to diversify out of the traditional product only when the marginal return from exporting the new product exceeded that for the traditional one by more than the costs associated with these externalities. Now that many of these centralized marketing systems for traditional export commodities have been liberalized, farmers need to take their own decisions regarding market information and export destination. This may create incentives to diversify depending on how efficiently the central agency used to work and whether the farmers are capable of competing on an equal footing, for example, with representatives of foreign trade houses.

2. Diversification into textiles and wearing apparel

49. Another picture emerging from table 6 is that none of the cotton-producing countries in sub-Saharan Africa has successfully diversified into the export of textiles, while increased export activities in the textile sector have been largely responsible for the successful diversification in countries such as Egypt, Tunisia, Haiti, Jamaica, Belize, Bangladesh, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, and Fiji. Mauritius is the only country of sub-Saharan Africa that succeeded in diversifying into textile exports. Similar to Bangladesh, whose experience will be discussed in detail below, Mauritius developed these exports because of the interest of Asian countries (Hong Kong and Taiwan Province of China) that took advantage of the low wages in Mauritius and the country's assured market access to the European Union without the restrictions of the Multi-Fibre Arrangement. Domestic conditions were favourable to foreign investment as Mauritius had a workforce with a good general education, a reasonably well-functioning financial sector and communication system, and adopted economic reform designed to establish a sustainable exchange rate and restriction-free access to production inputs.

50. Developing a textile industry may stimulate export diversification because it can engender substantial positive externalities by building a basic infrastructure, as well as by facilitating learning in both production and marketing in an area that differs from the traditional export commodities. Developing the appropriate shipment, transportation and communication networks, as well as efficient customs, banking and insurance facilities which are required for textile exports to expand, can facilitate the development of other (resource-based) non-traditional exports. In addition, doing so builds experience in basic managerial, financial and accounting activities, as well as the capacity to deliver products on time and with reasonable quality control. Domestic companies may build on these experiences and capacities to start their own export business.

51. Bangladesh is an interesting example of the successful development of an export-oriented textile sector.[37] The country's garment exports rose from virtually nil in the 1970s to about 40 per cent of its export earnings by the end of the 1980s. The production of export-quality garments started on the basis of a collabouration agreement between a company from the Republic of Korea and a Bangladeshi company, established for this purpose in 1979. The company of the Republic of Korea was attracted to Bangladesh by its low wages and, in particular, by its unused quota for exporting textiles and apparel to the markets of the United States of America and the EU. The labour-intensive activities in the textile sector were hence migrating within Asia because of unused export quotas, as well as rising labour costs, that eroded the comparative advantage certain countries used to have in this sector. Also, the upgrading of human capital, which was partly a result of the export activities in the textile sector, allowed a number of other countries from this region to engage in higher value-added activities. The value-added of garment exports from Bangladesh is relatively low because these activities depend on the import of machinery and cotton fabrics for manufacturing export-quality products. However, developing this sector has resulted in substantial dynamic externalities that can be a catalyst for expanding primary resource-based exports, such as processed foodstuffs or leather-related products, or other non-resource-based but higher-value-added exports, such as electronic machinery and chemicals. As Rhee (1990, p. 336) notes "Bangladesh was not exporting garments because of a total lack of domestic production technology and marketing know-how, and no apparent means of acquiring them from overseas. ... [No] domestic entrepreneurs seemed ready to seize the initiative" because of the high starting-up costs related to training and to developing effective information and marketing networks and because entrepreneurs cannot usually internalize the rewards from these initial investments. The collaborative arrangement ended in June 1981, after only about one and a half years. The fact that export activities nevertheless continued shows that much of the development of *sustainable* garment exports was accomplished by Bangladeshis themselves as they mastered the production and marketing know-how. Their success points to the quality and effectiveness of the training during the arrangement. As a matter of fact, 90 per cent of the workers who had received formal training in the Republic of Korea left the Bangladeshi company at the end of the agreement, often to start their own garment-exporting activities thereby transfering their know-how throughout the textile sector. Garment exports experienced a temporary setback in 1985 after the United States of America imposed severe quota restrictions. The setback was overcome by an easing of the quota situation and by a strategy to diversify markets.

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[37] The following two paragraphs draw on Rhee, 1990.

52. It appears that the critical element in the collabouration agreement for the success of Bangladesh's garment export was training, including the initial six-month formal training of a group of 130 Bangladeshi workers, including 14 women, in the Korean company; the familiarization with the operation of a successful, multifaceted international company and with the corporate culture that created and supported its superior performance, which was a by-product of the formal training in the Republic of Korea; and the learning-by-doing that took place later at the company in Bangladesh. Other elements for success were the fact that marketing was handled by the experienced Korean company, thus creating a reputation for the Bangladeshi company as a producer of quality garments and a reliable counterpart, and that the two companies succeeded in persuading the Government of Bangladesh to make administrative arrangements for basic export incentives (i.e. automatic access to inputs at world market prices, by introducing a duty-free and restriction-free regime for the imports used in export production, and trade financing at appropriate costs, by allowing for the Korean company's extension of short-term supplier credits for cotton fabrics and other production inputs). This suggests that although low labour costs played a role in starting garment-export activities in Bangladesh, it was domestic policy measures favourable to exporters, the capacity to learn and adapt to the new economic environment, as well as to spread the newly acquired knowledge, that were more important. It therefore appears that, apart from issues related to import quotas, replicating the success of Bangladesh in other low labour-cost countries is contingent on the adoption of a domestic economic stance that provides for basic export incentives and an equal footing with foreign competitors, as well as for the skills of the domestic labour force to react to these incentives.

53. Against the background of Bangladesh's experience, the question arises as to the reasons for the virtual cessation of activities in the textile(-export) sector in cotton-producing sub-Saharan African countries.[38] Most of these countries produce textiles, and some countries from this group, such as Chad, Senegal, Uganda and the United Republic of Tanzania, used to export part of their production to the regional market. It seems, however, that the economic reforms many of these countries adopted during the last few years have not attracted sufficient foreign investment to allow for imports of state-of-the-art technology and to familiarize the domestic workforce with the skills needed for export marketing. The main reasons for the reluctance of foreign investors to engage in Africa include continuing civil conflicts and political crises in many African countries, slow progress in a number of countries in introducing market and private-sector-oriented economic reforms,[39] poor or deteriorating physical infrastructure, and the lack or low level of skills and technological capabilities that keep productivity levels in many African countries below those of the developing countries of Asia or America with a similar low wage level.

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[38] On this issue, see also UNCTAD, 1994c and 1995b.

[39] It appears that a number of governments have pursued economic reforms on a selective basis, partly because these reforms have led to civil unrest and have not borne the expected fruits within a short period of time, and that therefore private foreign investors have been hesitant to choose Africa as an investment location. On the other hand, the lack of substantial private foreign investment may have been one reason for the absence of the expected improvement of economic performance following structural adjustment.

54. Relying solely on limited domestic resources in terms of capital, technology and skills, the cotton-producing sub-Saharan African countries have been unable to develop sustainable new export activities in their textile sectors. On the contrary, import liberalization, often undertaken as part of structural adjustment programmes, has favoured the emergence of traders specialized in textile imports and has thus contributed to a substantial decline in demand for domestic textiles on the home market. In addition, the textile industry in many of these countries is too large relative to the size of the domestic market, with the result that capacity utilization is often very low and production inefficient. Due to their low, and in many cases declning, purchasing power, consumers in these countries have changed their buying habits and tastes, and tend to substitute cheap, low-quality imported garments for more expensive traditional garments produced domestically. The high cost of domestic production, combined with the change in domestic consumption patterns and the rise in cheap clothing imports, has strangled domestic clothing production in many of these countries. Moreover, the textile industries were not able to upgrade the quality of their production or to adjust the style of their output fast enough to conform to the different and quickly changing consumer tastes on European and North American markets. Hence, new export markets could not be accessed on a sustainable basis. The major reason for this lack of adjustment to consumer needs may be that neither the government nor the private sector has provided adequate extension services in terms of market information and marketing strategies and support to invest in new production sites or in the rehabilitation of existing sites. The textile sector in Bangladesh, by contrast, seems to have been supported by a government strategy designed to facilitate, or at least not to impede, exports, an active private sector and feedback between the government and the private sector conducive to the development of activities in a new export sector.

D. Developing countries' export dependence on their three main commodities

55. As the reduction of a country's vulnerability to sector-specific adverse changes on world commodity markets can be considered the basic objective of export diversification,[40] the decline in a country's dependence on a limited number of commodities appears to be a more meaningful measure of a country's overall success in diversification than the decline in its dependence on the commodity sector as a whole. Data on developing countries' export dependence on their three main commodities in earnings from total merchandise exports are analysed in this section.

56. Table 8 shows that 35 of the 104 developing countries disccused in this study have reduced export dependence on their three main commodities since the end of the 1970s, whereas the situation has worsened for 22 countries and no significant change has occurred in 47 countries. Although there are successfully diversifying countries in all geographical regions, developing countries in South

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[40] The aims and objectives of diversification will be discussed in more detail in the second study of this series.

and South-East Asia as well as, to a lesser extent, those in North Africa and developing America, were relatively successful in this respect, while little improvement, or in some cases even a deterioration, occurred in most of sub-Saharan Africa and in a number of developing countries of other regions. Of the 35 developing countries that significantly reduced their dependence, 8 are in South and South-East Asia (of the 14 countries studied in this region), 3 (of 6) from North Africa, 3 (of 7) from the Caribbean, 5 (of 19) from Latin America, 11 (of 40) from sub-Saharan Africa, 2 (of 5) from developing Oceania, and 3 (of 12) from West Asia. By contrast, of the 22 developing countries whose dependence increased significantly, 11 are in sub-Saharan Africa, 4 in the Caribbean, 4 in South and South-East Asia, and 3 in Latin America. The developing countries of South and South-East Asia and Latin America head the five groups of countries listed in table 8; the countries of sub-Saharan Africa appear at the bottom half of the table. This suggests that the former countries reached the lowest level of dependence within each of these five groups by the end of the 1980s, while the dependence of the latter countries was still higher than that of countries from other geographical areas with a similar experience in diversification during the 1980s. What is more, apart from 12 oil-exporting countries and the Maldives, all of the 24 countries that were dependent on their three main commodities to over 90 per cent in the period 1989-1991 are from sub-Saharan Africa. It is also noteworthy that 8 out of the 12 countries that had a dependence of 40 or less per cent in the first period further reduced their dependence, sometimes significantly, or maintained their low level of dependence. In addition, Barbados, India and Zimbabwe are the only countries in this group that increased their dependence significantly. By contrast, out of the group of 29 countries that had a dependence of 90 or more per cent in the first period, only 10 reduced their dependence by 10 or more percentage points; however, these 10 countries still depend on commodities for more than 70 percent of their export earnings. This suggests the presence of a self-perpetuating momentum in dependence and diversification, with the result that a well-diversified economy is often a springboard for further diversification and that excessive dependence tends to prolong dependence.

57. Regarding the main economic sectors, countries that have a relatively low level of dependence and countries that have significantly reduced their dependence tend not to depend on any commodity sector (foods, agricultural raw materials, minerals and metals, fuels) for more than 50 per cent of their export earnings. Developing countries for which foods is the most important commodity sector tend to be more successful in reducing dependence. Jamaica, for example, (diversifying into textiles) is the only successful diversifier among the group of countries for which "minerals and metals" is the most important commodity sector, and the only successful fuels exporters are countries that diversified into the energy-intensive production of other commodities. An important reason for this experience may be that countries for which foods is the most important economic sector can find a non-traditional export commodity with a similar unit value as a traditional one more easily than countries for which "minerals and metals" or "fuels" is the most important commodity sector. Developing countries whose most important economic sector is agricultural raw materials have more potential for processing activities within their main commodity sector (e.g. into exports of processed forms of cotton or hides and skins) than other developing countries. The result is that successful processing activities in these countries tend to increase, rather than decrease, the share of their three main commodities in total exports.

Table 8: Developing countries' dependence on their three main commodities [a] and their main sector in merchandise exports, averages 1979-1981 and 1989-1991, in percentages

Country/territory	Share of three main commodities		Sectoral dependence, 1979-1981				Sectoral dependence, 1989-1991				Main export sector [b]
	1979-1981	1989-1991	Foods	Agricultural raw materials	Minerals and metals	Fuels	Foods	Agricultural raw materials	Minerals and metals	Fuels	1989-1991
Dependence reduced by 10 or more percentage points											
Hong Kong	29	14	2	30	2	0	3	14	1	0	Manufactures
Singapore	33	20	7	6	3	29	5	4	2	15	Manufactures
Philippines	38	25	36	18	18	1	19	20	9	1	Manufactures
Malaysia	52	30	15	34	9	20	12	17	4	15	Manufactures
Argentina	46	35	65	11	5	3	54	10	9	3	Foods
Mexico	66	40	14	4	7	61	11	3	9	35	Mixed
Cameroon	71	42	45	17	4	29	39	21	10	22	Mixed
Indonesia	75	50	7	14	4	67	10	28	8	37	Mixed
Cote d' Ivoire	71	53	64	22	1	5	57	15	2	0	Foods
Bolivia	68	55	7	3	56	25	15	7	44	27	Mixed
Madagascar	73	55	81	7	2	6	69	6	3	0	Foods
Colombia	68	56	70	13	5	3	34	13	9	33	Mixed
Tunisia	80	56	9	13	14	57	11	34	13	17	Mixed
Syrian Arab Rep.	89	57	4	12	2	77	12	13	2	40	Mixed
Sao Tome & Principe	92	65	93	0	0	0	68	0	0	0	Foods
Egypt	86	69	7	27	5	57	8	38	10	30	Mixed
Ghana	85	75	63	3	30	2	40	15	37	0	Mixed
Mali	92	79	55	35	4	0	38	48	8	0	Mixed
Mauritania	97	84	26	0	71	0	40	0	44	6	Mixed
Dependence reduced by between 9 and 5 percentage points											
Korea Rep. of	32	25	6	32	12	0	3	22	8	1	Manufactures
Thailand	37	30	43	20	14	0	28	26	8	1	Mixed
Morocco	60	51	25	13	49	4	24	25	25	2	Mixed
Kenya	64	57	46	10	5	27	61	7	5	12	Foods
Fiji	69	64	69	2	4	0	47	26	11	0	Mixed
Jamaica	82	73	18	2	75	3	19	9	58	0	Minerals and metals
Samoa	82	77	96	2	0	0	95	4	0	0	Foods
Bangladesh	85	78	12	82	0	0	14	72	0	0	Agr. raw materials
United Arab Emir.	88	80	1	0	1	87	1	0	2	78	Fuels
Cuba	90	81	88	0	5	1	80	0	5	1	Foods
Trinidad & Tobago	91	83	2	0	1	89	6	0	12	73	Fuels
Chad	95	86	32	66	0	0	40	50	0	0	Agr. raw materials
Venezuela	94	88	0	0	4	91	2	1	11	79	Fuels
Equat. Guinea	97	89	81	16	0	0	35	55	1	0	Agr. raw materials
Uganda	98	91	97	1	0	0	95	4	0	0	Foods
Saudi Arabia	97	92	0	0	0	97	1	0	0	92	Fuels
No significant change in commodity dependence											
Brazil	36	33	43	12	15	3	26	13	26	2	Mixed
Cyprus	36	35	33	30	12	5	29	23	2	1	Mixed
Jordan	40	40	27	8	27	0	12	4	39	0	Mixed
Turkey	39	41	47	24	11	1	20	30	18	2	Mixed
Uruguay	46	42	45	28	5	0	45	33	2	0	Mixed
Peru	41	45	15	5	33	18	19	6	41	7	Mixed
Guatemala	48	50	53	19	5	1	67	9	2	1	Foods
Nicaragua	59	55	68	19	8	1	70	16	8	0	Foods
Costa Rica	57	57	70	9	3	1	61	14	11	0	Foods
Sudan	64	61	38	50	0	0	40	50	0	0	Agr. raw materials
Panama	59	63	45	1	0	24	77	1	0	0	Foods
Afghanistan	68	64	33	25	2	29	42	39	0	0	Mixed
Senegal	66	66	44	6	20	20	56	5	15	13	Foods
Sierra Leone	67	68	31	0	64	0	22	0	72	0	Minerals and metals
Papua N. Guinea	68	71	39	7	49	0	21	9	62	0	Minerals and metals
Togo	72	72	25	5	52	13	20	18	52	1	Minerals and metals
Zaire	76	73	11	4	50	13	9	3	67	18	Minerals and metals
Paraguay	76	74	36	60	0	0	48	43	0	0	Mixed
Central Afr. Rep.	75	74	23	44	30	0	29	40	28	0	Mixed
Gambia	77	74	77	1	2	0	38	5	44	0	Mixed
Guinea-Bissau	79	75	82	10	5	0	82	13	0	0	Foods
Guyana	80	77	44	2	43	0	55	1	33	0	Foods
Solomon Islands	79	82	70	25	0	0	60	37	0	0	Foods
Ecuador	78	82	33	1	0	61	49	1	0	44	Mixed

Country/territory	Share of three main commodities		Sectoral dependence, 1979-1981				Sectoral dependence, 1989-1991				Main export sector [b]
	1979-1981	1989-1991	Foods	Agricultural raw materials	Minerals and metals	Fuels	Foods	Agricultural raw materials	Minerals and metals	Fuels	1989-1991
Ethiopia	85	83	74	18	0	7	74	19	0	0	Foods
Kuwait	88	84	1	1	1	88	1	1	1	83	Fuels
Mauritius	89	86	69	23	1	0	33	54	3	0	Agr. raw materials
Suriname	88	88	10	2	78	0	8	0	81	0	Minerals and metals
Bahrain	91	89	0	0	4	87	0	0	6	83	Fuels
Burundi	87	90	80	4	13	0	73	6	16	0	Foods
Somalia	94	90	91	6	0	0	93	5	0	0	Foods
Oman	93	90	1	0	0	92	2	0	1	90	Fuels
Niger	95	91	15	2	83	0	20	2	73	0	Minerals and metals
Seychelles	93	92	92	2	0	0	98	0	0	0	Foods
Angola	96	92	10	2	12	76	0	0	7	85	Fuels
Guinea	95	93	6	1	92	0	7	1	88	0	Minerals and metals
Zambia	94	93	0	0	95	1	1	1	93	1	Minerals and metals
Qatar	95	95	0	0	5	92	0	0	4	81	Fuels
Brunei Darussalam	97	95	0	0	0	97	0	0	0	96	Fuels
Nauru	96	95	0	0	95	0	0	0	96	0	Minerals and metals
Maldives	94	96	84	4	1	0	72	25	0	0	Foods
Libya	98	97	0	0	0	98	0	0	0	97	Fuels
Nigeria	94	97	2	0	0	92	2	1	0	95	Fuels
Congo	95	97	2	7	5	84	1	11	2	85	Fuels
Algeria	99	98	0	0	1	99	0	0	1	98	Fuels
Iran, Islamic Rep. of	97	99	0	4	0	95	2	2	0	95	Fuels
Iraq	98	99	0	0	0	98	2	0	0	97	Fuels
Dependence increased by between 5 and 9 percentage points											
United Rep. of Tanzania	49	56	60	19	4	3	60	33	6	0	Foods
Dominica	54	60	55	1	2	0	61	1	0	0	Foods
Cape Verde	72	83	71	1	21	0	96	1	0	0	Foods
Malawi	78	86	88	5	0	0	89	3	0	0	Foods
Botswana	88	94	17	2	77	0	6	0	92	0	Minerals and metals
Gabon	90	96	1	7	10	77	1	12	7	78	Fuels
Dependence increased by 10 or more percentage points											
India	25	39	26	28	15	0	16	26	23	2	Mixed
Barbados	31	45	27	9	2	0	26	9	3	25	Mixed
Zimbabwe	31	50	28	9	19	1	41	10	31	0	Mixed
Haiti	50	65	39	20	12	0	28	55	0	0	Agr. raw materials
Belize	53	66	54	14	0	2	65	22	0	0	Foods
Chile	57	68	14	11	54	1	24	11	54	0	Minerals and metals
Nepal	52	69	27	57	1	0	9	74	1	0	Agr. raw materials
Pakistan	58	71	22	48	0	5	9	71	0	0	Agr. raw materials
Dominican Rep.	56	72	60	3	30	0	42	10	41	0	Mixed
Sri Lanka	63	73	46	28	4	14	31	47	11	2	Mixed
Honduras	62	74	78	11	6	0	81	6	1	0	Foods
Benin	69	80	60	19	6	5	16	57	0	16	Agr. raw materials
Burkina Faso	67	88	32	49	1	0	16	55	21	0	Agr. raw materials
Rwanda	78	88	66	5	10	0	85	6	3	0	Foods
Comoros	82	95	88	0	1	0	72	0	10	15	Foods
Liberia	84	96	5	30	63	0	3	43	52	0	Minerals and metals

Notes: [a] See Annex II for the definition of commodities.

[b] An economic sector is referred to as a country's "main export sector" when it accounts for 50 or more per cent of the country's earnings from total merchandise exports. Where "mixed" is indicated as a country's main export sector, none of the distinguished economic sectors accounted for 50 or more per cent. The share of manufactures has been calculated as a residual. Data inconsistencies are due to rounding.

Source: UNCTAD database.

58. Data from figures 2 to 6 and table 8 suggest that developing countries of Asia and Latin America which, as a group, have had the largest increase in export diversification, have not done so at the expense of the production of commodities; these countries are also among those that have increased the volume of commodity exports the most. This suggests that having a strong and already well-diversified commodity sector is important for further diversification both within and out of the commodity sector. In addition, data in table 8 prompt the question as to why some countries had a better diversification experience than others with a similar natural-resource endowment as measured in terms of, for example, the main economic sector in a country's export structure. The third part of this series will focus on this question, looking at main economic characteristics of developing countries and the differences between commodity-dependent developing countries regarding the provision of economic incentives and their abilities to react to these incentives.

E. Conclusions

59. The statistical data in table 6 suggest that during the 1980s various types of export diversification in developing countries occurred simultaneously. For those developing countries that successfully diversified their export structure horizontally, diversification often occurred into a limited number of non-traditional raw materials, in particular food items, which can be grown under similar climatic and technological conditions to the traditional ones and be marketed in a way that the exporters are familiar with through the marketing of their traditional crops. Some developing countries have also diversified into products of footloose industries. Such diversification may be advantageous for economic development provided that the required technological and managerial capabilities are not overly sophisticated for the domestic labour force to adapt to within a short time and to disseminate the acquired knowledge and skills to other individuals and economic sectors. The commodity-specific diversification picture that emerges from the statistics is that, at an early stage, new export commodities of successful diversifiers tend to include horticultural products and fisheries, as well as garments, textiles and footwear, while at a later stage, countries can build on their improved physical and human capital and try to diversify into more sophisticated manufactured products.

60. The experience of individual countries in vertical diversification suggests that few developing countries have been successful in moving up the processing chain for their commodity exports, and those that have been successful have not engaged in capital-, technology- and skill-intensive activities. Vertical diversification also can be difficult since it often involves building up industrial production in sectors where established exporters have a competitive edge over new entrants because of internal economies of scale. Middle-income developing countries may thus have an advantage in vertical diversification compared to low-income developing countries, if their larger domestic demand allows the production scale necessary to be competitive on world markets and eventually to export part of their production at least as a vent for surplus.

61. Lifting market-access barriers in developed countries could improve market opportunities and diversification perspectives in developing countries. Table 5 shows that the incidence of non-tariff barriers (i.e. the form of market-access barriers that have gained importance over the last few years) in major developed countries is higher for developing countries than for developed market economies. On the other hand, many developing countries that have been the most dependent on the export of commodities in processed or unprocessed form have, in general, not been able to take advantage of export preferences when accorded, while other developing countries that have faced the same or higher market-access barriers have nonetheless succeeded in diversifying their export structure. This suggests that, although important, market-access barriers in developed countries are not the prime reason for limitations in the export diversification experienced by many developing countries.

62. As to why some countries have successfully diversified while others with a similar natural resource endowment and stage of development have not, the data in figures 2 to 6 suggest that the successful countries, i.e. of East Asia and developing America, have increased the volume of non-oil primary commodity exports the most. It therefore appears that a strong traditional commodity sector is often a good basis for export diversification; this points to the importance of having a strong and efficient agricultural sector for successful export diversification. In addition, it suggests that successful diversification within the commodity sector is an important driving force behind diversification out of the commodity sector. The disappointing commodity export performance of African countries as a group suggests that problems on the supply side, including a lack of competitiveness and of an adequate level and composition of technological and managerial capabilities, may have been a reason for their poor economic performance over the last few years. Reform of national policies designed to improve economic incentives and the ability of economic agents to react to those incentives thus seem to be important conditions for improved export diversification for countries that are still highly dependent on a few commodities for their export earnings.

Annex I

STATISTICAL MEASUREMENTS OF DIVERSIFICATION

1. The fact that there are different ways to measure diversification may cause some confusion about diversification experience. The purpose of this annex is to discuss the usefulness of two widely used measures of diversification, namely concentration indices and export portfolios, for analysing developments in the diversification of developing countries' commodity exports.

2. The measurement of diversification focusing on *commodity* exports was discussed in chapter 1. The degree of diversification of a country's export basket *as a whole* has frequently been assessed on the basis of a concentration index [e.g. UNCTAD Handbook of International Trade and Development Statistics and Bond and Milne (1987)]. This index focuses on the hypothetical relationship between variety and stability. The underlying assumption is that a lower concentration or wider variety of exports will lead to increased stability or growth in export earnings as a whole. Following the Gini-Hirschmann coefficient,[1] the index of country j's export concentration (C_j) is defined as:

$$C_j = 100\ (\Sigma(X_{ij}/X_j)^2)^{1/2} \qquad i = 1,\ldots,n$$

where X_{ij} is the value of the ith good exported by country j,
X_j is the total value of country j's exports, and
n is the number of export product groups.

A country's exports are said to be more concentrated, or less diversified, the higher the value of C_j; the concentration index is 100 in a country that exports only one good. The lower limit of the index is determined by the number of product groups weighted by their share in total exports. The index equals 100 times the reciprocal of the square root of n when total exports are divided equally among product groups.

3. Concentration indices are generally used to describe the degree of diversification of a country's export basket *as a whole*. Calculations of this index as such can therefore not be used for the purposes of this study, i.e. to measure diversification between export of commodities and manufactures as well as within the commodity sector. A lower degree of diversification in a country's commodity exports may, for example, be outweighed by a higher degree of concentration in manufactures. The concentration index would hence indicate no change even though the higher share of manufactures in the country's export basket will reduce the probability that the country will be faced with adverse developments in its export earnings.

4. It also seems impracticable to calculate a concentration index taking into account only commodities, i.e. excluding manufactures. This is because the formulation of the concentration index "implicitly assumes that the cross elasticities of demand among product groups are equal. Thus, the level of data disaggregation affects not only the absolute value of the index but may also

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[1] As Ali et al. (1991, p. 39) point out, other concentration indices such as the ogive and entropy indices lead to rankings of export concentration very similar to that obtained by the Gini-Hirschmann index. Therefore these three indices are, in general, interchangeable.

result in a misspecification of the underlying trade structure. ... [The] concentration index is uniformly higher when the number of product groups is smaller ... Changes in the number of product groups, as occurs when the SITC classification moves from the one-digit to the three-digit level, moreover, [result] in changes in the ranking of countries according to the degree of their export diversification" (Bond and Milne 1987, p. 121). Given that commodities of export interest to developing countries are not classified within a uniform level of digits in SITC (see annex table A3 for data) it does not seem practicable to measure the degree of diversification of a country's commodity exports by a concentration index that uses SITC for disaggregation. Moreover, using such an index would not allow for a distinction of processing stages within the commodity sector or for an assessment of diversification out of commodities.

5. Ali et al. (1991) and Alwang and Siegel (1994) suggest considering an 'optimal export portfolio' as an alternative measure of the empirical link between export diversity and export-earnings instability. Within this concept, export diversification is aimed at reducing the variance of a country's export portfolio by adjusting the existing export shares of commodities or adding 'new' commodities to a country's export basket. The variance of a country's export portfolio mirrors the instability of its export earnings. In equation (1), which defines the variance of the export portfolio, the first term specifies the non-diversifiable risk, while the second term specifies the diversifiable risk. The non-diversifiable risk is the minimum risk in the case of no covariation, i.e. complete specialization in the commodity with the most stable export earnings. The diversifiable risk is determined by covariances. According to this measure, a country will therefore aim at exporting commodities whose correlation coefficients are negative, because if export earnings from two specific commodities are negatively correlated, the resulting covariance lowers the overall variance of the export portfolio.[2] Ali et al. (1991, p. 12) point out that use "of the portfolio variance allows the comparison of the impact of alternative export diversification strategies by examining their effect on instability. By choosing commodity mixes carefully and examining covariances (correlations), the portfolio variance can be minimized." The portfolio variance V is defined as:

$$(1) \quad V = \sum_{i=1}^{n} W_i^2 \, VAR(P_iX_i) + \sum_{i=1}^{n} \sum_{\substack{j=1 \\ j \neq i}}^{n} W_iW_j COV(P_iX_i, P_jX_j)$$

where W_i is the export share of commodity i,

P_iX_i are the export earnings from commodity i, with P_i being the price and X_i being the export quantity,

VAR (P_iX_i) is the variance of export earnings for commodity i,

COV (P_iX_i, P_jX_j) is the covariance in export earnings from commodities i and j,

the sum of W_i equals 1 and all W_i are non-negative.

6. Correlation coefficients and covariances have been calculated for a number of commodities and reported in annex table A1. Data in the table suggests that

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[2] Covariance and correlation coefficients are closely related. The covariance matrix can be expressed as: COV $(X_i, X_j) = \rho_{ij}\sigma_i\sigma_j$ where ρ_{ij} is the correlation coefficient and σ_i and σ_j are standard deviations.

there is co-movement of prices for commodities, such as silver and rubber or copper and tropical logs, that seems unrelated in terms of production or consumption substitutability or complementarity. A diversification strategy adopted on the basis of these results would be seriously flawed. First, commodity prices can be expected to move in parallel to the extent that all commodity markets are affected in the same way by macroeconomic shocks, such as world recession (commodity prices will tend to decline because of falling demand) or general inflation (commodity prices will tend to rise because commodities are sometimes considered to provide a hedge against inflation). The problem to be addressed would therefore be whether there is *excessive* co-movement in commodity prices, i.e. that observed after accounting for macroeconomic shocks. Empirical evidence on this question is contradictory, the difference in results presumably reflecting the difference in methodological approaches employed to test the excess co-movement hypothesis.[3] While there is agreement as to the possibility of excess co-movement, there is disagreement on whether it can be observed across a wide range of commodity prices. Secondly, it has been shown that the behavior of prices differs substantially between low-frequency (annual) and high-frequency (quarterly and monthly) data series, with macroeconomic variables explaining a high proportion of price changes for low-frequency data series (Leybourne et. al., 1994, p. 1756). A diversification strategy based on portfolio considerations would hence in part depend on whether the portfolio was calculated from low- or high-frequency data series.

7. More importantly, however, portfolio theory, which was originally developed for financial assets, cannot be used to determine optimal export portfolios without modifying the original approach (Alwang and Siegel, 1994). The reason is that the asset base of an investor is composed of liquid resources, i.e. financial assets, which the investor can easily allocate among investment opportunities, while a country's asset base, i.e. its productive resources, is not very liquid with the result that, for example, a country cannot adjust the allocation of productive resources instantly and without cost. Alwang and Siegel (1994, p. 411) also mention that numerous studies show that "export volume instability is generally greater than international price instability ..., so that if export earnings are to be stabilized, volume instability must also be considered". They therefore modify the portfolio approach by introducing an elasticity measure so that the problem to be solved becomes that of changing export volumes (or adjusting resources devoted to different production activities) rather than that of choosing among different W_i combinations. One of the results of the empirical test of their approach is that changes in stability relationships occur over time in the sense that each country - they look at Malawi, the United Republic of Tanzania and Zimbabwe - "had at least one commodity whose impact on instability or earnings changed dramatically from one period to the next" (ibid., p. 419). In short, applying portfolio theory to export diversification does not seem to be very promising.

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[3] See Leybourne et al. (1994) and the literature quoted therein for a recent analysis of this question.

Table A1: Price correlation coefficients and covariances for selected primary commodities, 1975-1994

	Wheat	Coffee	Cocoa	Cotton	Tropical logs	Rubber	Copper	Lead	Silver	Petroleum
Wheat	1.00	-0.18	-0.20	0.29	-0.05	0.39	0.27	0.31	0.50	0.54
		-4,485	**-3,725**	**1,837**	**-74**	**1,873**	**3,305**	**1,497**	**5,095**	**102**
Coffee		1.00	0.85	0.17	-0.49	0.30	-0.40	0.22	0.31	0.15
			748,092	**50,877**	**-34,354**	**68,113**	**-231,384**	**50,202**	**149,272**	**1,343**
Cocoa			1.00	0.15	-0.49	0.34	-0.42	0.37	0.48	0.52
				33,558	**-25,676**	**57,696**	**-181,586**	**63,105**	**115,198**	**1,071**
Cotton				1.00	0.14	0.51	0.21	0.37	0.48	0.52
					2,494	**24,429**	**30,874**	**21,450**	**58,752**	**1,183**
Tropical logs					1.00	0.17	0.76	0.54	-0.15	-0.11
						2,297	**26,171**	**7,335**	**-4,300**	**-59**
Rubber						1.00	0.37	0.66	0.70	0.51
							41,217	**28,967**	**64,811**	**879**
Copper							1.00	0.43	0.09	0.05
								48,130	**21,289**	**220**
Lead								1.00	0.48	0.36
									44,654	**624**
Silver									1.00	0.68
										2,490
Petroleum										1.00

Note: The first row for each commodity shows the correlation coefficients, while the second row shows the covariances

Data description: Monthly data with the following description of the prices:

Wheat: US, No.2, Hard Red winter (ordinary), f.o.b. Gulf (International Wheat Council).

Coffee: Other mild Arabicas, weighted average of:
- ex-dock New York, (75%), El Salvador Central Standard, Guatemala Prime Washed, Mexico Prime washed.
- ex-dock Bremen/Hamburg (25%), El Salvador Strictly High Grown, Guatemala Hard Bean, Nicaragua Strictly High Grown.

Cocoa: Average of the daily prices of the nearest three active future trading months on the London Terminal Market and on the New York Coffee, Sugar and Cocoa Exchange at time of the London close. Article 26 of the International Cocoa Agreement, 1986 (International Cocoa Organisation, London).

Cotton: Short: U.S. Orleans/Texas, Middling 1" (short staple).

Tropical logs: Sapelli, high quality (loyal and marchand), f.o.b. Cameroon. (Market News Service, ITC, Geneva).

Rubber: Singapore, f.o.b. in bales, No. 1 RSS, closing quotations (The Public Ledger, Watford, United Kingdom).

Copper: London Metal Exchange, grade A, electrolytic wire bars, cash (Metal Bulletin, London)

Lead: London Metal Exchange, settlement and cash seller's price in warehouse excluding duty, range main United Kingdom ports; Purity 99.97% Pb (Lead and Zinc Statistics, International Study Group, London).

Silver: Handy & Harman, 99.9% grade refined, average of daily quotations, New York (Metal Bulletin, London).

Petroleum: Average of Dubai, United Kingdom Brent and Alaska N Slope crude prices, reflecting relatively equal consumption of medium, light and heavy crudes worldwide. Dubai: Fateh 32 API, spot, f.o.b. Dubai; United Kingdom: Brent Blend 38 API, spot, f.o.b. United Kingdom ports; United States: Alaskan N Slope 27 API, spot, f.o.b. US Gulf of Mexico ports.

Source: UNCTAD database

Annex II

THE METHODOLOGICAL APPROACH ADOPTED TO CREATE A DATABASE ON COMMODITY DEPENDENCE AND DIVERSIFICATION

8. The database is intended to provide disaggregated information at the country level on commodity dependence in countries' merchandise export earnings, as well as on horizontal and vertical diversification in these countries' merchandise exports. The commodity classification used in the database is the United Nations Standard International Trade Classification, Revision 2 (SITC, Rev. 2). Annex table A3 shows the products included in the database. In general, tables show data available in March 1994.

9. The sources for the database are the United Nations Statistical Office, the Food and Agricultural Organization of the United Nations (FAO) (for food and agricultural raw materials), UNCTAD secretariat compilations (for minerals and metals),[1] national trade statistics (COMTRADE), the International Monetary Fund, and the Economist Intelligence Unit. The latter two sources have mainly been used for those products for which there are no UN data series, i.e. in particular for clothing, precious stones and gold. The classification of countries used in the database has been adopted for statistical convenience and does not imply any judgement on the stage of development of any particular country, territory or area.[2]

10. As inconsistencies were found for some countries, in particular in Africa, regarding their aggregate total merchandise exports and total commodity exports, percentage shares have been adjusted using the best available estimates from all sources. In this exercise, commodity-specific data series have generally been considered more reliable than series on total merchandise exports.

11. Studies on commodity diversification and processing have both conceptual and statistical problems because of the ambiguity and arbitrariness of the definition of processing, including the distinction between commodity processing and manufacturing. Processing can be defined as the stage or the series of stages of transformation between the primary production of a commodity and its manufacturing into a form ready for final consumption (see Wall (1980, p. 304) for this definition).

12. A major problem arising from this consumption-based classification is that it is often not clear where the primary production stage ends and the processing stage begins, or where the processing stage ends and the manufacturing stage begins. Several commodities have end-uses at the intermediate, and even the unprocessed, primary stage. Soya beans are an example of a product that can be used at the primary stage as a feed and foodstuff. Vegetables, fruits, fish and shellfish are examples of other processing chains where consumption is possible at the fresh (unprocessed) stage of the commodity (for example, see, Yeats (1991) for using a consumption-based methodology).

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[1] See UNCTAD Commodity Yearbook, General Notes Section IV, for further details.

[2] See UNCTAD Commodity Yearbook, General Notes Chapter V, for further details.

13. Defining the processing stages from the point of view of production, therefore, appears preferable for a study on commodity export dependence because it allows drawing the line between the processing stages on the basis of technology-related or capital intensity-related changes in production processes. The iron ore-steel processing chain illustrates this issue. Steel ingots and semis used to be allowed to solidify and were re-melted to produce of steel products and therefore separate processing stage for ingots and semis could be distinguished. However, with the gradual transition to continuous casting in steel production, there is no longer any intermediate stage between pig iron and steel products. Not considering steel products as commodities would hence mean not taking into account any processing in the iron ore-steel chain. This would, however, not be consistent with the consideration of processing stages for the other metals. The following classification as suggested by Singer and Stephenson (1978, pp. 4-5)[3] has thus been adopted for this study: "As soon as a raw material undergoes any degree of fabrication at all, this product will be termed 'processed' and the commodity considered to be no longer in its primary stage. At the other end, as long as the single raw material represents a major input to the fabricating operation this will be called 'processing' but when this is no longer the case, the activity will be considered as 'manufacturing' and the product 'manufactured'." The problem with this definition is that metal concentrates have undergone fabrication but are classified in the same data series as metal ores; hence, they are part of the first form in which the metal is traded. Since this paper focuses on exports, metal concentrates will be considered raw commodities.

14. While this differentiation between processing and manufacturing may be acceptable as a definition at this point in time, technological and marketing innovations, for example in the automobile sector, may exacerbate the conceptual problem in defining commodity processing in the future. The tendency of automobile companies to ask their suppliers of production inputs increasingly to deliver tailor-made, composite products may eventually lead to a situation characterized by an immediate processing of a raw material into a high-technology, composite product that would probably have to be considered a manufactured product. Strictly speaking, there would then no longer be a place for commodity processing.

15. The arbitrariness of any definition of processing is exacerbated if an attempt is made to generalize the definition for several commodities. The reason for this is that commodity-specific processing chains do not have a common structure of processing stages. In this context, a consumption-based definition of processing would tend to limit seriously the cross-commodity comparability of the processing stages as, e.g. fruit juices and vegetable oils would be classified as belonging to the same stage as non-ferrous metals bars and plates. All these products would have to be classified as belonging to the final stage of processing since they are ready to be consumed. A production-based classification, by contrast, tends to allow for a better cross-commodity comparability of the stages as, for example, fruit juices would be at the same stage as unrefined copper rather than with copper bars and sheets.

16. A decision also has to be taken with respect to the number of processing stages to be considered. Following an earlier study by UNCTAD (1976), three such

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[3] The quotation is from Takeuchi and Chung (1979, p. 7).

stages have been distinguished for this study. However, more than three processing stages can be identified for several commodities, especially agricultural raw materials, and it is therefore often a matter of choice where the line between the stages is drawn for a specific commodity. In the cotton-processing chain, for example, fabrics and grey cloth have been considered semi-processed like yarn since spinning and weaving is often an integrated process. For minerals and metals, the classification used in the UNCTAD databank codes has been adopted. This means that semi-processed stages are considered for copper, nickel, aluminium and iron ore but not for the other metals. The reason for this is that the unwrought stage of a metal has been considered the first level of the processed stage of a metal. Given that there are no intermediate stages between the ore and unwrought stages for lead, tin, zinc and uranium/thorium, considering a semi-processed stage for these metals would lower the level of comparability.

17. To summarize, comparing processing stages across commodities on the basis of a production-based classification is not satisfactory. This is due to the fact that no clear-cut criteria, either economic or physical, can be found to allow allocating processing activities unambiguously and meaningfully to the processing stage. Thus, any criterion used for this allocation will necessarily be ad hoc and arbitrary. However, using this classification would appear to be the best feasible possibility.

18. What is more, even if the conceptual problem could be solved and a satisfactory classification found, statistical problems would still limit its applicability in practice. The reason for this is that trade data are usually collected on the basis of the SITC with the result that outputs at distinct stages of processing or products made of different raw materials may be lumped together in one data series. An example of the latter is the data series on shoes, which does not distinguish between shoes, made of leather or rubber.

19. The result of these conceptual considerations is that the database created for this study includes a new aspect compared with the data used in the UNCTAD Commodity Yearbook, e.g. for calculating the share of primary commodities in all merchandise trade values (Yearbook table 1.19), and with earlier studies on diversification and processing.[4] This aspect concerns the difference between what is considered as 'primary commodities including fuels' in the UNCTAD Commodity Yearbook and what has been considered as a commodity in this database. 'Primary commodities including fuels', as reported in the Commodity Yearbook, refer to SITC sections 0-4 (less groups 233, 244, 266, 267), division 68 and item 522.56. In the economic literature, a (primary) commodity is usually widely defined as a material that is relatively homogeneous (i.e. not a composite of different materials), produced in a standardized manner with a relatively low content of technology and relatively little value-added, and that serves as an end-product for consumption (e.g. food) or as an input for a wide range of uses in manufacturing.

20. On the basis of this definition and evolutions in production processes that have occurred in several commodity sectors over the last two decades, two

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[4] See, for example: Bond, M. and E. Milne (1987) and UNCTAD (1989a). UNCTAD (1976) presents a similar classification of processing stages as the present study but does not apply this classification in a country-by-country analysis.

additions have been made to the traditional definition of primary commodities for the database used for this study. First, precious stones (SITC group 667) and non-monetary gold (SITC group 971) have been added as it seems to be clear that they are primary commodities. Precious stones and gold are raw materials rather than composites of different materials. The level of technology employed in most developing countries to obtain them is usually low considering that they are often mined by small-scale miners. Moreover, precious stones exported by developing countries are usually uncut and unpolished (exceptions include India and Thailand) and can therefore be considered fairly homogeneous. It is generally acknowledged that export statistics for precious stones and gold are not always reliable, particularly as they do not include unrecorded trade. Data on export earnings for these two commodities are therefore based on estimates to a larger extent than those for other commodities. However, given that precious stones and gold account for a substantial part of total foreign-exchange earnings for a large number of developing countries, it appears that including data based on the estimates lowers the margin of error with respect to the 'true' composition of these countries' exports.

21. Secondly, higher processing stages for agricultural raw materials as well as for minerals and metals than those included in the traditional definition of 'primary commodities', have been taken into consideration. The additional goods considered include leather, fur skins and leather products; rubber articles; veneer sheets, plywood and other wood articles; paper and paperboard; silk yarn and fabrics; cotton yarn, fabrics and clothing; jute products such as bags and sacks; and steel (see annex table A3 for the respective SITC codes). This inclusion takes account of the standardization of production processes, for example, in the cotton/clothing sector that has occurred since the 1960s, and allows for a more detailed assessment of a country's success in diversification. With the classical definition of 'primary commodities', a country would reduce its commodity dependence by, for example, processing raw wood into veneer sheets and plywood, jute into jute products or cotton into cotton yarn, fabrics and clothing, although it does not appear that by doing so they made a "qualitative leap" into the production of heterogeneous composite materials that contain a high value added. Regarding minerals and metals, processed stages of iron ore (SITC division 67) have been included in order both to harmonize the consideration of processing in the metals sector and to raise the comparability of statistics in this sector. As a matter of fact, processed products of non-ferrous metals (SITC division 68) are included in the definition of primary commodities whereas those of iron ore are not. The above-mentioned changes in the production process in the iron ore/steel mean that for this sector only iron ore is considered in export statistics based on the definition of primary commodities, ignoring exports of processed products from this sector.

22. The impact of the mentioned additions on statistics on developing countries' commodity dependence are highlighted by comparing annex table A2 and table 1. This comparison shows that statistics on commodity dependence, based on the definition of primary commodities as used in the UNCTAD Commodity Yearbook, tend to overstate diversification out of commodities into manufactures for two reasons. First, exports of precious stones and non-monetary gold are not considered exports of primary commodities and hence are treated as manufactures. In addition, a developing country that exports for example, cotton yarn and jute bags and sacks would be considered an exporter of manufactures like an industrialized country exporting airplanes and computer chips. Finally, the traditional statistics understate developing countries' success in moving up the processing chains of their export commodities.

Table A2: Developing countries distributed by determined shares of *primary* commodities[a/] in total merchandise export earnings (1989-1991 average; 1979-1981 average in brackets) (number of countries)

Region	Total primary commodities			Raw commodities			Semi-processed commodities			Processed commodities		
Share [%]	>70	70-50	<50	>70	70-50	<50	>40	40-20	<20	>40	40-20	<20
North Africa	3 (5)	1 (1)	2 (0)	1 (3)	1 (3)	4 (0)	0 (0)	0 (0)	6 (6)	1 (0)	0 (0)	5 (6)
Other dev. Africa	36 (37)	3 (2)	1 (1)	26 (30)	6 (4)	8 (6)	0 (0)	4 (6)	36 (34)	2 (1)	3 (3)	35 (36)
Oceania	2 (5)	3 (0)	0 (0)	2 (3)	2 (2)	1 (0)	0 (0)	1 (0)	4 (5)	0 (0)	0 (0)	5 (5)
West Asia	8 (10)	2 (2)	2 (0)	4 (8)	2 (1)	6 (3)	0 (0)	0 (0)	12 (12)	2 (1)	1 (2)	9 (9)
S. & South-East Asia	3 (8)	3 (3)	9 (4)	1 (3)	2 (3)	12 (9)	0 (0)	1 (1)	14 (14)	1 (1)	0 (1)	14 (13)
Caribbean	4 (4)	1 (2)	2 (1)	0 (1)	3 (3)	4 (3)	1 (1)	0 (0)	6 (6)	1 (1)	0 (0)	6 (6)
Latin America	12 (14)	6 (4)	1 (1)	4 (5)	7 (8)	8 (6)	1 (1)	1 (0)	17 (18)	0 (0)	4 (3)	15 (16)
All countries (104)	68 (83)	19 (14)	17 (7)	38 (53)	23 (24)	43 (27)	2 (2)	7 (7)	95 (95)	7 (4)	8 (9)	89 (91)

a/ Includes gold and diamonds in addition to primary commodities, as defined in the UNCTAD Commodity Yearbook; the definition of processing stages is given in Annex II.
Note: Includes all developing countries (104) for which consistent data are available.

Source: UNCTAD database.

Table A3: Processing stages of selected commodities

	Commodity	SITC, Rev 2	Processing stage[1]
I.	FOODSTUFFS and TOBACCO		
	LIVE ANIMALS	001	R
	MEAT		
	Fresh, chilled or frozen	011	R
	Salted, in brine, dried or smoked	012	R
	Prepared or preserved, nes; fish extracts	014	S
	DAIRY PRODUCTS		
	Milk and cream, fresh	022.3	R
	Milk and cream preserved, concentrated, sweetened	022.4	S
	Butter	023	S
	Cheese and curd	024	S
	EGGS		
	Eggs in shell	025.1	R
	Eggs not in shell	025.2	R
	FISH		
	Fresh, chilled or frozen	034	R
	Dried, salted or in brine, smoked; including fish meal fit for human consumption	035 035.01	R R
	Flours and meals of fish unfit for human consumption	081.42	S
	Fish oil	411.1	S
	Prepared or preserved, nes	037.1	S
	CRUSTACEANS and MOLLUSCS		
	Fresh, chilled, in brine, dried or frozen	036	R
	Prepared or preserved nes	037.2	S
	WHEAT, BARLEY, MAIZE and other CEREALS		
	Unmilled cereals	041 043-045	R R
	Wheat flour and meal	046	S
	Other cereal meals and flours	047	S
	Cereals preparations, etc	048	P
	RICE		
	In husk or husked but not further prepared	042.1	R
	Milled rice	042.2	S
	VEGETABLES		
	Vegetables, fresh, chilled and frozen	054	R
	Vegetables, prepared or preserved	056	S
	FRUITS		
	Fruits, fresh or dried	EX057	R
	Fruits, prepared	EX058	S
	NUTS (excluding groundnuts)		
	Nuts fresh	057.7	R
	Nuts prepared	EX058	S

SUGAR		
Raw sugar	061.1	
- centrifugal		R
- non-centrifugal		R
Refined sugar	061.2	S
Molasses	061.5	S
Sugar confectionery and other sugar preparations	062	P
COFFEE		
Coffee beans, raw or roasted	071.1	R
Extracts, essences or concentrates of coffee	071.2	S
		S
COCOA		
Cocoa beans, raw or roasted	072.1	R
Cocoa powder	072.2	S
Cocoa cake and paste	072.31	S
Cocoa butter	072.32	S
Chocolate and chocolate products	073	P
TEA and MATE		
Tea	074.1	R
Mate	074.2	R
SPICES	075	R
MARGARINE and SHORTENING	091	S
EDIBLE PRODUCTS AND PREPARATIONS nes	098	S
NON-ALCOHOLIC BEVERAGES	111	S
ALCOHOLIC BEVERAGES		
Wine, vermouth, etc.	112.1	S
Cider, etc.	112.2	S
Beer, etc.	112.3	S
Dist. alcoholic beverages	112.4	S
TOBACCO		
Tobacco leaves	121	R
Cigars, cigarettes, and tobacco products nes	122	S
GROUNDNUTS		
Groundnuts, unshelled or shelled	222.1	R
Groundnut oil	423.4	S
Groundnut cake	081.32	S
SOYA BEANS		
Soya beans	222.2	R
Soya bean oil	423.2	S
Soya bean cake	081.31	S
COTTON SEED		
Cotton seed	222.3	R
Cotton seed oil	423.3	S
Cotton seed cake	081.33	S
SUNFLOWER		
Sunflower	222.4	R
Sunflower oil	423.6	S
Sunflower seed cake	081.35	S

SESAME		
Sesame seed	222.5	R
Sesame oil	423.92	S
RAPE		
Rape seed	222.6	R
Rape seed oil	423.91	S
Rape seed cake	081.36	S
COCONUTS and COPRA		
Coconuts, fresh	EX057.71	R
Coconuts, desiccated	EX057.71	R
Copra	223.1	R
Coconut oil	424.3	S
Coconut cake	081.37	S
PALM KERNELS		
Palm kernels	223.2	R
Palm kernel oil, crude or refined	424.4	S
Palm kernel cake	081.38	S
PALM OIL		
Palm oil crude and refined	424.2	S
LINSEED		
Linseed	223.4	R
Linseed oil	424.1	S
Linseed cake	081.34	S
CASTOR SEED		
Castor oil seeds	223.5	R
Castor oil	424.5	S
OLIVE OIL	423.5	S

II. <u>AGRICULTURAL RAW MATERIALS</u>

LEATHER		
Hides and skins of cattle, sheep, goats and of animals of minor importance	211	R
Fur skins	212	R
Leather	611	S
Fur skins, tanned or dressed	613	S
Leather products other than shoes including		
· shoe uppers	612.3	S
· travel goods	EX 831	P
· articles of apparel and clothing accessories	848.	P
Fur clothing and other articles made of furskins	848.3	P
Leather footwear	EX 851	P
RUBBER		
Natural rubber (including rubber latex)	232	R
Simple rubber articles (e.g. pastes, plates, sheets)	621	S
Other rubber articles:		
· tires	625	P
· articles nes	628	P
· footwear of rubber	EX 851	P
WOOD		
Fuelwood: · fuelwood	245	R
· charcoal		R

Saw logs, veneer logs	247	R
Sawnwood and sleepers	248	S
Wood-based panels:- Veneer sheets	634.1	S
- Plywood and blockboard	634.2,41	S
Wood articles nes	635	P
Chairs and other seats	821.1	P
Furniture of wood nes	821.92	P
PAPER, PAPERBOARD, PAPER PULP		
Pulpwood	246	R
Pulp and waste paper	251	S
Paper and paper board	641	S
Paper and paperboard, cut to size or shape, and articles of paper and paperboard	642	P
Floor coverings of paper or paperboard	659.11	P
SILK		
Raw silk	261.3	R
Silk yarn and thread	651.1	S
Silk fabrics	654.1	S
COTTON		
Cotton lint	263.1	R
Cotton combed and carded	263.4	R
Cotton yarn	651.3	S
Cotton fabrics, woven	652	S
Cotton articles:		
- made-up articles (e.g. linen)	EX 658	P
- clothing	EX 842-9	P
JUTE		
Raw jute and bast fibres	264	R
Jute products (bags and sacks)	658.1	S
VEGETABLE TEXTILE FIBRES (other than cotton and jute)		
Flax fibre, tow and waste	265.11-13	R
Ramie	265.14	R
Hemp	265.2	R
Sisal and other agave fibres	265.4	R
Manila fibre (abaca)	265.5	R
Coir	265.91	R
WOOL AND OTHER FINE ANIMAL HAIR		
Wool greasy	268.1	R
Other animal hair	268.3	R
	268.5-7	R
Wool degreased	268.2	R
Yarn of wool or animal hair	651.2	S
Wool fabrics, woven	654.2-3	S
Knitted or crocheted fabrics	655.21	S
Wool articles:		
- made-up articles	EX 658	P
- carpets	EX 659	P
- clothing	EX 842,3	P
	EX 845.91	P
MINERAL AND CRUDE VEGETABLE MATERIAL including gum arabic and cut flowers	29	R R
ANIMAL OILS and FATS	411.3	S

ANIMAL and VEGETABLE OILS and FATS		
Oils boiled	431.1	S
Oils hydrogenerated	431.2	S
Fatty acids	431.31	S
Residues of fatty substances	431.33	S
Waxes	431.43	S
Spermaceti	431.44	S

III. ORES, MINERALS and METALS

FERTILIZERS		
Natrium calcium phosphate	271.3	R
Phosphoric acid	EX 522.24	S
Phosphorus pentoxid	EX 522.24	S
Manufactured fertilizers:		
· nitrogenous fertilizers	562.1	P
· phosphatic fertilizers	562.2	P
· potassium fertilizers	562.3	P
CRUDE MINERALS		
Stone, sand and gravel	273	R
Sulphur	274.1	R
Natural abrasives (including industrial diamonds)	277	R
Other crude minerals	278	R
IRON		
Iron ore and concentrates, non-agglomerated	281.5	R
Iron ore and concentrates agglomerated	281.6	R
Primary iron and ferro-alloys	671	S
Ingots and semis	672	P
Steel products	673-679	P
URANIUM and THORIUM		
Ores and concentrates of uranium and thorium	286	R
Uranium and thorium unwrought or wrought and articles thereof	688	P
COPPER		
Copper ore and concentrates	287.11	R
Copper unrefined	682.11	S
Copper refined	682.12	P
Master alloys and alloys unwrought	682.13	P
Copper and copper alloys worked	682.2	P
NICKEL		
Nickel ore	287.21	R
Nickel mattes, intermediate product	287.22	S
Unwrought nickel and nickel alloys	683.1	P
Nickel and nickel alloys worked	683.2	P
ALUMINIUM		
Bauxite	287.31	R
Aluminium waste and scrap	288.23	R
Alumina	287.32	S
Unwrought aluminium and aluminium alloys	684.1	P
Aluminium and aluminium alloys worked	684.2	P

LEAD		
Lead ore and concentrates	287.4	R
Unwrought lead and lead alloys	685.1	P
Lead and lead alloys worked	685.2	P
ZINC		
Zinc ores and concentrates	287.5	R
Unwrought zinc and zinc alloys	686.1	P
Zinc and zinc alloys worked	686.3	P
TIN		
Tin ores	287.6	R
Tin waste and scrap	288.26	R
Unwrought tin and tin alloys	687.1	P
Tin and tin alloys worked	687.2	P
· semimanufactures		
· plates and sheet		
MANGANESE		
Manganese ore and concentrates	287.7	R
Ferromanganese	671.61	S
TUNGSTEN		
Ores and concentrates	287.92	R
SILVER, PLATINUM and GOLD		
Ores and concentrates of precious metals	289	R
Gold, non-monetary (excluding gold ores and concentrates)	971	S
Silver and platinum unwrought, unworked or semi-manufactured	681	P
Goldsmiths' and silversmiths' wares, jewellery	897	P
IV. NON-METALLIC MINERAL MANUFACTURES		
Pearls, precious and semi-precious stones	667	R
V. FUELS AND ELECTRIC ENERGY		
COAL, COKE and BRIQUETTES	32	R
PETROLEUM		
Crude petroleum	333	R
Petroleum products, refined	334	P
Residual petroleum products	335	P
GAS, natural and manufactured	341	R
ELECTRIC ENERGY	351	P

Note: (1) R = raw; S = semi-processed; P = processed.
Source: UNCTAD secretariat.

Annex III

EFFECTIVE RATES OF PROTECTION FOR SELECTED COMMODITIES

23. Table A4 presents data on effective rates of protection that shed further light on market-access barriers in the form of tariffs and tariff escalation. Data presented here are not strictly comparable with that in table 7 because data in table A4 refer to tariffs in the early 1980s, while the data in table 7 refer to the late 1980s. In addition, tariffs in table A4 do not refer to complete processing chains or single out commodity exports from developing countries. The fact that effective rates of protection presented here are often higher than nominal tariffs as given in table 7 could therefore indicate that effective rates were in fact much higher than nominal rates, but could also be due to factors such as the inclusion of commodity trade among developed countries or trade liberalization that occurred during the 1980s.

24. Keeping these caveats in mind, data in table A4 support the argument made earlier that commodity trade faces significant access barriers to markets of developed countries. It is interesting to note, however, that there are several examples for which tariff de-escalation exists, including: the leather sector in Finland and Japan; the cotton sector in Austria, the EEC and Finland; the jute sector in Finland, Japan and Switzerland; and the wool sector in New Zealand. To what extent developing countries are affected by escalation or de-escalation in effective rates of protection is, however, difficult to gauge since the data do not distinguish between countries of origin.

Table A4: Approximations of the effective rate of protection for selected processed commodities

Processed commodity	Australia	Austria	EEC	Finland	Japan	Norway	New Zealand	Sweden	Switzerland	United States	All developed countries
Processed meat	18.4	9.4	51.7	50.4	59.6	7.6	15.2	0	8.3	4.4	15
Preserved sea food	3	15.4	26.5	2.1	23.2	5.3	-2.1	0.3	3.7	2.5	3.7
Preserved fruits	22.8	55.5	40.8	2.7	21.6	8.8	41	1	30.7	72.5	43.4
Processed vegetables	27	43.5	37.9	16.2	40.2	15.2	21	5.2	29	20.2	30.6
Coffee extracts	2.2	-32.9	45.5	a/	76.6	0.4	136.8	0	-2.4	0	42.6
Chocolate	44.6	-12.8	a/	4.8	82.6	0.5	78.6	-0.1	51.5	0.1	-3.3
Tobacco manufactures	23.2	401.5	117.4	4	156	9.7	50.6	3.6	33.4	9.4	47.0
Vegetable oils	10.5	5.5	50.6	71.6	49.6	37.4	0	8.3	67.2	-1.5	36.1
Leather	22.8	2.3	6	7	21.2	0.5	43.2	0.5	0.2	8.1	7
Leather manufactures	36	3.6	9.9	6.1	18.6	7.4	45.3	7	2.4	17.5	13.7
Rubber manufacturers	22.7	2.4	4.5	6	1.1	1	16.1	2.2	0.4	-0.4	5
Wood manufactures	30.4	1.3	9.2	0.2	1.3	0.4	24.6	1.3	0.8	10.3	7.4
Paper and paperbroad	13.7	2.3	5.5	0.5	13.7	0	2.2	0.5	-0.4	0.7	4.3
Articles of paper	19.7	9.7	12.6	1.1	0.7	0.2	53.1	0.4	0.3	8.7	7.6
Cotton fibres	-19.9	4.1	11.8	2.5	10	7.2	1.3	5.4	-0.4	13.5	11
Cotton yarn	-27.8	8.8	7.6	2.1	13.7	8.3	4.7	6.8	4.3	18.3	9
Jute yarn	32	2.9	7.2	2.5	19.8	0	0	0	5	4.7	8.7
Jute fabrics	a/	7	10	-1	5.3	0	0	3.5	-1.6	*	0.3
Wool yarn	12.2	0	1.1	0	14	0.4	70.9	0	0	18.1	7.8
Wool fabrics	69.1	0.3	5.1	0	25.3	0.4	60.1	0.6	0	85.8	34

Note: a/ No effective tariff rate is given since the ratio of the input to final product tariff could not be computed.

Source: Yeats, A. (1987, p.119)

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